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CONTENTS

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BRONSON MUSEUM

Tel. 222-5470

This, the Society Museum, is located on the 5th Floor of the Attleboro Trust Co. building, at 8 North Main Street, Attleboro, Mass. — Museum Hours are from 9:30 to 4:00, Mondays, Tuesdays, and Thursdays; other days by appointment. Contact the Society office at the museum; Maurice Robbins, Director, William S. Fowler, Curator and Preparator.

The museum has extensive exhibits of stone implements, obtained for the most part from central Massachusetts areas. They have been arranged in the four culture periods identified in the Northeast that extended over the past 10,000 years; diagnostic artifacts are shown in the culture to which they belong.

Beside seven large dioramas depicting scenes of aboriginal activities, many large wall-case displays have been added. These contain impressive ceremonial remains of cremated burials that exhibit probable mortuary rites of Late Archaic peoples, who lived 4,200 to 4,700 years ago on the shores of Assawompsett Lake. The museum has been developed so as to aid archaeological research for those interested in gaining comprehensive information about the cultural development that took place in New England throughout its four culture periods; Paleo, Early Archaic, Late Archaic, and Ceramic-Woodland.

A NEW CHALLENGE FOR MASSACHUSETTS ARCHAEOLOGY

JOHN ROSSER

> The nation's past is contained in its soil. That soil is being disturbed and redistributed at an ever-increasing rate. *Those of us alive today will be the last ever to see any significant portion of it in an undisturbed state.* (McGimsey 1972: 17).

The new challenge is site destruction, not only in Massachusetts, but elsewhere across the nation. In states where estimates of archaeological site destruction are available, the outlook is frightening. McGimsey estimates (McGimsey 1972: 3) that in Arkansas 25% of know sites have been destroyed just within the past ten years. In Oregon it is estimated (Pletsch 1974: 260) that of the forty-five major archaeological occupation sites know to have existed on the Oregon coast between 1900-1950, today only one remains intact and only 20% of the others survive in part. Of the forty sites in the Portland area in 1971, by 1974 only three sites remained undisturbed. State and federal land-use projects, especially during the last twenty years, are the major cause of accelerated archaeological site destruction in Oregon and elsewhere in the United States. The result is that nationwide, archaeologists are running out of sites. In California alone, it is estimated that over 1000 sites are destroyed annually (Thomas 1974: 32).

To get an idea of the magnitude of the problem in the United States, one has only to glance at any of the various newsletters published by archaeological societies across the nation. Here is an item from the April, 1976 *Newsletter* of the Archaeological Society of Maryland (Clark 1976):

> A significant prehistoric site on the Smith River, just south of Fielddale, Va., will be totally destroyed in the next month by construction of a sewerage treatment plant. Test excavations by the Patrick Henry Chapter of the Archaeological Society of Virginia in 1968 revealed the outline of a Late Woodland, palisaded village site 225 feet in diameter. A portion of the stockade, the entire interior of the site, a possible burial area outside the stockade, and a historic period site require excavation.

Nor are such problems peculiar to the United States. Increasingly archaeologists in all parts of the world are being faced with similar problems. An example which this author knows something about was reported recently from Messenia, in that beautiful and untrammeled part of southwestern Greece, the chief town of which is Pylos. In the past, the danger of site destruction has been minimal. Those days in Messenia, however, may be drawing to a close. I refer the reader to this excerpt from a recent article in the *New York Times:*

> The Greek Government recently announced that a large shipyard would be built at Pylos and that steel and cement plants would also be constructed in the vicinity. The $550 million project, the Government said, would provide needed jobs in one of Greece's poorest regions.
>
> The National Archaeological Council, which had recommended against the project, resigned en masse. Editorial writers joined the protests. The magazine New Greece said: "This kind of progress cannot bring happiness. Future generations will mourn the blight we have cast on their lives."
>
> The Pylos project poses difficult problems. Greece clearly wants, and needs, the benefits of economic growth. Just as clearly, the monuments and landscape of the country belong to the whole civilized world, and should be preserved.
>
> Can these two values be reconciled in some acceptable balance between economic growth and protection of the cultural environment? (Roberts 1976).

No overall statistics for site destruction in Massachusetts exist, but such information that is available is alarming. Some of the most significant was reported by Barbara Luedtke, in a paper delivered to the 1975 autumn meeting of the Coalition for Archaeology in Massachusetts (Luedtke 1975). Professor Luedtke stated that at present, of sixty-five known prehistoric sites in one town in the Connecticut River Valley, only five (less than 8%) are well enough preserved so as to be of value for research. Destruction of prehistoric sites in industrialized areas of Massachusetts is virtually complete. Even in a relatively unindustrialized part of the state, Essex County, only a third of the estimated original number of sites have survived to date. Of these known in Essex County sites, many have been undoubtedly destroyed since they have been recorded. Massachusetts' coastal prehistoric sites are already largely lost due to land disturbance which began in the 17th century. Professor Luedtke concluded her paper with the alarming prediction that if prehistoric site

destruction continues at the present rate in Massachusetts, no sites will be left in twenty-five years.

Dena Dincauze recently reported (Dincauze and Meyer 1975) that of 638 sites (61.9% of which were listed as "condition unknown") in three counties in northeastern Massachusetts—Essex, Middlesex and Suffolk—only 1.4% were known to be more than 50% intact, and 26.3% were known destroyed.

The experience of one chapter of the M.A.S., the South Shore Chapter, may be instructive. The chapter was chartered in 1952. In its first publication on prehistoric sites in the Cochato Valley (Ayres et al. 1955), twenty-one sites were reported, of which five were listed as destroyed. It was at the Lind site, a site being stripped of topsoil for commercial use, "that many chapter members, in a race against the bulldozers, gained their first archaeological experience" (Ayres et al. 1955: 48). Another site, which the chapter began excavating in 1966, was threatened by imminent destruction in the late 1960s when plans for the extension of a major highway were revived. This site, called Green Hill, later produced Middle Archaic C-14 dates of about 8000 years ago. In the early 1970s, some South Shore Chapter members helped to salvage yet another site which was in the process of being destroyed (Parker 1974).

Until very recently, responsibility for slowing down the rate of site attrition in Massachusetts fell mostly on the State Archaeologist. Now, however, the Massachusetts Historical Commission has added a staff archeologist whose job it is to inventory the state's cultural resources and to nominate appropriate ones to the National Register of Historic Places (an effective way of protecting endangered archaeological sites). A network of M.A.S. volunteers has been established to provide information about endangered sites to the offices of the State Archaeologist, the Massachusetts Historical Commission, and to the Coalition for Archaeology in Massachusetts. The Coalition has succeeded in coordinating preservationist efforts in the diverse Massachusetts archeological community, which includes the M.A.S., professional archaeologists, Native Americans, museum personnel, secondary school educators, state historical societies, and industrial and underwater archaeological groups.

A significant reduction in site attrition in the near future, however, can be accomplished *only* if the M.A.S. and the professional community cooperate with a sense of urgency, giving the problem the highest priority. The relationship between avocational and professional is the subject of apparently endless debate (for a recent interchangem, see Pollak 1976 and McGimsey 1976). Yet effective cooperation between professional and avocational archaeologists is imperative if archaeology in Massachusetts, indeed in any state, is to survive (Garrow 1976).

It is clear that the audience toward which professional and avocational archaeologists must chiefly devote their attention is the general public. It is true that the public has little idea that the state's archaeological resources are in danger of being altogether destroyed. However, simply making the public aware of this fact will not give us the support we need unless we convince the public that there is a value in preserving archaeological sites so that archaeological research can continue in the future (Lipe 1974: 216-217). Moreover, it is unlikely that any significant reduction of site attrition in Massachusetts can be accomplished without public funds. "No public support means no money" (McGimsey 1972: 63) is a tried and true dictum. Alabama provides a portion of the salary of one archaeologist, plus approximately $3000 for archaeological research annually. Maine provides about the same. Kansas provides salaries equivalent to four or five archeologists for full-time research plus approximately $15,000. Florida provides salaries equivalent to eight archaeologists full-time plus approximately $150,000. Mississippi, by no means a rich state, provides salaries equivalent to two to three archaeologists plus approximately $5,000. A glance through McGimsey's *Public Archaeology,* the source of the above information, shows Massachusetts to be one of four states in the nation which provides *no* annual funds for archaeological research. Massachusetts, with some of the richest archaeological resources in the United States (prehistoric and historic), does not pay its state archaeologist a salary (only recently have his office expenses been paid)!

Funds will also be needed for an adequate systematic survey of archaeological resources in the state. The importance of such a survey can not be overestimated. Most state surveys are unsystematic, insofar as they consist only of inventories of sites which have been reported. It is not unusual for unconscious biases to exist in such data, e.g. the nearness of sites to paved roads and plowed fields. Moreover, what about the blank areas on our survey maps? Do they indicate (as occasionally state land-using agencies will imply) that no sites exist there, or is it simply incomplete reporting? Obviously Massachusetts can never be completely surveyed, but a representative sample can be obtained using modern, sophisticated sampling techniques (Binford 1964; Mueller 1975). Such a representative example of the archaeological resources in the state would make more intensive surveys over smaller areas possible by eliminating some types of locations from further consideration. The distributions of archeological sites often correlate well with environmental features, and a sampling-based survey, in addition to a search of existing literature, would provide planners with information about such correlations at a fraction of the cost of a 100 percent inventory (Lipe 1974: 225). Such a

survey would also reveal the kinds of sites which should be preserved for the future, not merely sites which were thought significant in the 1970s, but a *representative* sample of the entire data base.

The M.A.S. will ultimately play a larger role in site preservation than any other single group in the archaeological community. The great advantage which the M.A.S. enjoys is in its membership, which is large, scattered throughout the state, and of diverse backgrounds and professions. The membership of no other group in the archaeological community so well reflects the general public. Moreover, the M.A.S. has a long tradition of public education, which has resulted in numerous archaeological exhibits which travel well beyond the museum in Attleboro. The objectives of the M.A.S., which are to encourage scientific archaeological research, have had a beneficial educational effect on those of its members who began as mere collectors. As an example of what can be done within a single M.A.S. chapter, the South Shore Chapter is developing a program of archaeological displays, literature and tours at the Blue Hills Trailside Museum which will reach more than 15,000 visitors annually. If any group in the archaeological community has the capability of having a leavening effect on the public at large, it is the M.A.S.

The M.A.S. is also potentially one of the most effective lobbies archaeology in Massachusetts could ever hope to obtain. A small group of M.A.S. members applied the public pressure which resulted in the passage of state archaeological legislation in 1973. M.A.S. members have already nominated endangered archaeological sites to the National Register of Historic Places. If the M.A.S. defined as a matter of highest priority, the creation of a lobbying capacity to rival that of the Audubon Society, the possibility of acquiring public support and public funds, without which our endeavors will fail, would be enhanced enormously. After all, archaeologial sites are more endangered than most endangered species of wildlife. At least a small group of mates can replenish the latter.

There is one tool of great value in the preservation of archeological sites, namely already existing archaeological legislation. This tool, however, is only imperfectly understood by most of us, and for that reason a summary of this legislation has been attached as an appendix to this essay. For those readers unfamiliar with the legislation, it may come as a surprise that preservation of archaeological resources is the keynote, not salvage procedures. Salvage archaeology is only the last resort when all else has failed. Furthermore, it is the responsibility of the state and/or federal land-using agency involved in a particular project to identify all archaeological (and other cultural) resources which might be adversely affected by the project. Steps must then be taken to preserve the resource, or at least mitigate an adverse impact. The identification of such resources has to be done in the earliest planning stages, not at the last moment before (or while) the bulldozers begin their work. Unfortunately, in Massachusetts more than a few state agencies are unfamiliar with their legal responsibilities in this respect, and unless the archaeologial community is willing to educate both the agencies and the general public, it may be some time before these laws become operable.

Archaeology in Massachusetts today is in a state of most rapid flux, and tensions abound. In national professional journals, great emphasis is being placed on the explanation of cultural change, not merely the description of cultures through typological studies. Increasing emphasis is being placed on environmental data. "Problem-oriented" research has made its appearance in the study of Eastern North American prehistory (Dragoo 1976: 3-4). The sheer amount of information about the prehistory of southern New England has greatly increased through the recent studies of Dena Dincauze (Dincauze 1971, 1972, 1973, 1974, 1975, 1976). The publication of the Neville site (Dincauze 1976) was the most important event ever in the study of New England's Middle Archaic.

The implications of these developments for the avocational community are not altogether clear, but they surely must result in a much greater reliance on professional resources, especially for the processing of environmental data. Problem-oriented research is not off-limits to avocationals, but it does place upon avocationals the responsibility of reading more widely in professional journals, becoming more aware of professional and institutional resources, and in some cases changing quite drastically older methodology. Simple stratigraphic excavation, with a reliance on the classification for interpretation of cultural data, can not be justified anymore in Massachusetts (Dincauze 1976: 137). It is not "wrong," it is simply not enough. The classification of stone tools, for instance, has increasingly become dependent upon functional analysis (microscopic analysis of edge-wear), something avocationals can learn. The chief problem most of us face, however, is that there is too much to learn, and, with the exceptions of those academics who are paid to keep abreast of new developments, most members of the broader archaeological community simply do not have the time.

These new developments will undoubtedly create some strain between avocational and professional archaeologists, unfortunately at a time when cooperation between them is absolutely essential if the problem of accelerating site attrition in Massachusetts is to be squarely faced. This, we must bear in mind, is the biggest problem for our generation of archaeologists. Within a few decades we may well be censured by a new generation for whom we failed to preserve more

than a meagre sliver, if that, of Massachusetts' archaeological heritage.

Where personal satisfaction and pleasure conflict with a full and energetic response to this new challenge, the former should yield. There can be no more "private archaelogy" in Massachusetts, except for those so sufficiently troglodytic to ignore the obvious. For most of us in this state, however, archaeology will increasingly become a matter of serious public responsibility.

APPENDIX

A SUMMARY OF RECENT ARCHAEOLOGICAL LEGISLATION

This summary attempts to condense and explain what is most important in recent federal and state legislation affecting Massachusetts. Further information on federal and other state legislation can be found in McGimsey's *Public Archaeology* (1972). The reader is cautioned that some of McGimsey's data are by now out-of-date, and of course this is nowhere more true than for that section devoted to Massachusetts. Two fine monographs by Tom King (King 1975a, 1975b) I have used to trace my own way through the tangle of federal legislation, and anyone reading these monographs will notice that I rely heavily on them in this presentation. I am also indebted to Frank McManamon, Staff Archaeologist for the Massachusetts Historical Commission, for his comments on state legislation (McManamon 1976). My summary of Massachusetts legislation neglects to mention recent underwater archaeological legislation, but this neglect is due only to the need for a certain selectivity and brevity; the line of exclusion had to be drawn somewhere, and for most readers what is included will be more than enough.

A. RECENT STATE LEGISLATION

The most important state archaeological legislation is found in *Chapter 1155 of 1973,* which amends *Chapters 9, 36, 40, etc.* of the General Laws. *Chapter 1155* is a very important state law, the passage of which was greatly aided by several dedicated M.A.S. members. Among other provisions, this law empowers the State Archaeologist to issue permits to qualified individuals and institutions for archaeological explorations and excavations on state, city or town land, with the consent of the agency or political subdivision in charge of that land. Suitable reports must be filed with the Massachusetts Historical Commission, and archaeological artifacts found under such permits become the property of the commonwealth. Violations of this law are punishable by a fine and/or by imprisonment.

The next most important state legislation is found in *Chapter 781 of 1972,* which amends *Chapter 30* of the General Laws. *Chapter 781* established MEPA, the *Massachusetts Environmental Policy Act.* This act in some respects parallels similar federal legislation of 1969. An environmental review process for state actions which may damage the state's natural environment (construed to include damage to archaeological resources) is established under the Executive Office of Environmental Affairs (EOEA). This review process requires that potential damage from such state actions be minimized.

In practice, the primary function of the EOEA is to review state environmental assessment forms. A state agency proposing a project with falls under MEPA's jurisdiction must file an assessment of projected environmental damage. *This assessment must be made in the initial planning stages of the project.* State funds are provided for professional consultation to help agencies make correct environmental assessments. When the environmental assessment forms are completed, they are filed with the Executive Office of Environmental Affairs, which publishes them in the *Environmental Monitor.*

The *Environmental Monitor* is a very important publication. It appears every fifteen days, and is free upon request on a yearly basis (write to Secretary Evelyn F. Murphy, EOEA, 100 Cambridge Street, Boston, MA 02202). Within thirty days of an environmental assessment being published in the *Environmental Monitor,* if no one has filed a legitimate complaint, a project can commence. Most of us have little idea of proposed state projects until they actually begin, and by then it is probably too late for the endangered archaeological site. Concerned M.A.S. members should request a subscription of the *Environmental Monitor,* which contains notices of many federally assisted projects as well.

MEPA directly covers all projects of local redevelopment authorities, housing authorities and development commissions. MEPA indirectly covers private and local public activities or projects that need permits or licenses from state agencies. MEPA does not cover projects of local city and town agencies which do not need permits or licenses from state agencies, or which do not involve state funds. Violations of MEPA are prosecuted by the Attorney General at the request of the EOEA, or any other appropriate agency, e.g. the Massachusetts Historical Commission, or the office of the State Archaeologist.

B. FEDERAL LEGISLATION AND PROCEDURES

The chief federal legislation affecting archaeological resources in Massachusetts can be summarized as follows:

> *The National Historic Preservation Act of 1966* (P.L. 89-665): This act expands the National Register of Historic Places, to which significant historic and prehistoric properties can be nominated. It also establishes the Advisory Council on Historic Preservation. An agency

proposing a project which endangers a property either on the National Register or eligible for the National Register must consult with the Advisory Council on Historic Preservation to find ways to avoid or mitigate the destruction of the property.

The National Environmental Policy Act of 1969 (P.L. 91-190): Any agency proposing a project which is federally funded or licensed must submit to the Council on Environmental Quality an environmental impact statement. The procedures of the Advisory Council on Historic Preservation are used to help avoid or mitigate any adverse impact on cultural resources.

Executive Order 11593 of 1971: This order directs federal agencies to locate any properties under their control which might qualify for the National Register. It requires that agencies exercise caution in the meantime to be sure that they do not unnecessarily damage eligible properties on federal lands. It requires that federal agencies exercise leadership in the protection of such properties not on federal lands. The thrust of this law is to extend protection in federally involved projects to sites not yet on the National Register, but eligible for it.

The Archaeological Conservation Act of 1974 (P.L. 93-291): This act authorizes federal agencies to expend money on surveys, salvage and other forms of cultural resource protection. It establishes the review authority of the Department of the Interior over federal cultural resource programs.

These laws deal with the responsibilities of federal agencies which plan, permit, and assist in construction or land-use projects. Notice particularly that the intent of the laws throughout is toward preservation and conservation. Exactly what these laws mean for the agencies involved is spelled out in the *Procedures for the Protection of Historic and Cultural Properties,* established by the Advisory Council on Historic Preservation as Title 36, Chapter VIII, Part 800, Code of Federal Regulations. The basic message of *36 CFR VIII 800,* as it usually referred to, is that federal agencies must use certain procedures to identify all cultural resources which may be affected by any project which receives a federal license or federal funds. Such cultural resources (which includes archaeological resources) must be identified *before a decision is made to proceed with the project.* The center around which these procedures revolve is the National Register of Historic Places.

The National Register is not a list of national monuments. It is simply a record of historic and prehistoric properties which are thought to be important enough not to be thoughtlessly destroyed. If an endangered archaeological site is not on the National Register, *it is the responsibility of the agency using federal funds or a a federal license to asecertain if it is eligible for the National Register.* There are various criteria for eligibility, the most important of which for archaeological sites is that they ". . . have yielded, or may be likely to yield, information important to prehistory or history." It can be argued that in the absence of a regional plan for the state which specifies what kind of sites are most important, every historic and prehistoric site meets National Register criteria. In practice, however, the Massachusetts Historical Commission, which proposes properties for the National Register (after which nominations are forwarded to the Secretary of the Interior for approval), will require specific information about the importance of the archaeological site in question.

It should be emphasized at this point that *only* if endangered archaeological sites are either on the National Register, or considered eligible to the National Register, can federal funds be spent to help save them. In order to make sure that all qualified archaeological sites in a proposed project area are identified, an archaeological survey is usually undertaken. Such a survey is funded by the agency and involves a systematic professional inspection of archaeological resources in the project impact area. Such a survey must be taken in the earliest planning stages of the project. It is not enough for an agency to simply consult the National Register, or even the M.A.S. site maps. For one thing, archaeological surveys made prior to the *National Environmental Policy Act of 1969, Executive Order 11593,* and *36 CFR VIII 800,* are not usually adequate to assure compliance with these laws. In most cases a new survey will be required, and the agency must fund one that is professional.

The exact type of survey which is done is something which has to be determined, but at the least it will involve a sample field survey plus a literature and records check usually followed by localized intensive field surveys. A simple check of known sites is not enough. Once an agency has determined, usually with the aid of a survey, what archaeological sites exist within the proposed project area, then the agency must determine if these sites are eligible for the National Register. This is the crucial stage, because only sites which are on, or are eligible for the National Register can have federal funds expended on them for avoidance or mitigation of an adverse impact.

The agency must next determine if such sites are going to be adversely affected by the proposed project. There are several kinds of adverse effects, from the

destruction or alteration of all or part of the property, to neglect of a property which finally results in its deterioration or destruction. If such an adverse effect is determined, then the Advisory Council, the State Historical Preservation Officer (Elizabeth Reed Amadon of the Massachusetts Historical Commission) and the agency involved must seek ways in which that adverse effect can either be eliminated or mitigated. As a last resort, this may include salvage. Whatever solution is finally agreed upon is drawn up in a legally binding Memorandum of Agreement, between the relevant agency and the Advisory Council on Historic Preservation. *36CFR VIII 800* empowers the State Historic Preservation Officer to withhold approval from, and thereby effectively stop, any project which does not comply with these procedures. Remember that there are very few land-use projects in Massachusetts that do not make use of federal funds and/or licenses.

Boston College
July 1976

For everything in this article, I take full responsibility. I want to thank, however, Dena F. Dincauze and Frank McManamon for their helpful comments and criticism.

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THE FORT HILL BLUFF SITE

WILLIAM B. TAYLOR

At a sharp bend in the Taunton River just beyond the head of tidewater from Narragansett Bay appears a prominent table-top boulder at the river's edge. For many years it has been known as Sentinel Rock, and colonial records mention it in use as a platform by Indians of those days, when fishing the swirling water at its base. The river's bank rises precipitously behind it to a height of some 35 feet. Here is a commanding view of the surrounding low lands to the north. It was here that a comparatively small palisaded fort was built by Nemasket Indians in Contact days, as a defense against attack from their Indian enemies. The fort's existence is verified by memoranda from early times in the Bennett family, reported as follows: "The Nemasket Indians and the neighboring tribes built this Fort for their own protection. They had two doors to the Fort, one next to the river and one on the opposite side." (Weston 1906:398 note 2).

On the basis of this information, and a statement handed down in the Dunham family from past generations that the fort stood on the hill above Sentinel Rock, excavation was undertaken in 1952. The Cohannet Chapter of the Society, after exploratory testing, uncovered four lines of post molds in the palisaded structure. It was found to have a rectangular shape of approximately 35 x 41 feet, with a protected opening in its walls of posts both in front and in back (Fig. 1). One important natural feature was a never-failing spring only a stone's-throw from the fort, that would have contributed toward a successful defense of long duration. However, no significant artifacts were recovered from within the structure to show extended occupancy. A few post molds in an interior front corner of the fort suggest the possible existence of a lookout platform as a means of peering over the palisaded walls; or perhaps it was some kind of a shelter for a few people. This was all that remained to tell what may have taken place within the stockade.

Outside the structure, casual excavating nearby was more successful. Here, evidence was exposed in the loam to indicate the possible presence of fort defenders in early colonial days. The finds consisted of 3 musket balls, a copper cutout arrow point, a steel knife blade, and various objects such as a glass mirror, kaolin pipe fragments, flat rolled copper pieces—probable remains from the making of copper cutout points—and a small tubular glass bead, as reported by Karl Dodge (1953:81). Also recovered by surface hunting were 6 gun flints.

After the fort excavation had been completed, the excavators and others believed that there might have existed a camp close by, where the people may have lived, the fort being used only as a place to retreat to in the event of an attack. With this thought in mind, during the following year and for six succeeding years William H. Taylor and the writer, with the help of other Society members, carried on further excavations back of the fort. Here seemed to be the most likely living area, as the land in front of the fort fell off sharply to the river below, while that to the rear was relatively level, with a gentle slope away from the structure.

At first a 4 foot wide trench was dug skirting a large growth of trees, which defied a less obstructed plan of operation. Eventually, an area 200 x 350 feet was excavated, commencing at the rear of the fort and extending some distance up stream. Soil depths varied somewhat throughout the dig due to natural surface erosion. None the less, four periods of occupation have been defined by the types of recovered projectile points—depth measurements were not recorded—when compared to similar types at other well stratified sites. This comparison provides a culture sequence that is generally accepted as a standard to be expected at sites being excavated. Here at Fort Hill—the earliest occupation of the site—Early Archaic—may be identified by Bifurcated, and Corner-removed#5,8,9 points. Following this comes the next period—Late Archaic—with Corner-removed#7, Tapered Stem, Eared, Small Stem, and Small Triangular#4 points. The third period—Ceramic-Woodland—is represented by Large Triangular, Small Triangular#5, Corner-notched, and Small Stem points. Finally, the fourth period—Contact—may be identified by such recovered items as copper arrow points, musket balls, gun flints—probably related to the Indian occupation at the time of the fort, fragmented kaolin pipes, and the bowl of a pewter spoon that appeared with the handle broken off.

Along with these objects other implements were uncovered, which likewise lacked definite recorded depths at which they were found. They consist of a Wing atlatl weight preform with its drilling only just started, a Clumsy plummet, Celt, Plain gouge, 2 Sinew-stones, scrapers, drills, knives, a pestle, and Hammer-stones. Some of these, along with representative projectile points from the site—typologically arranged, in the case of the points, as to the respective cultures to which they belong—are included in two groups of illustrations (Figs. 2&3).

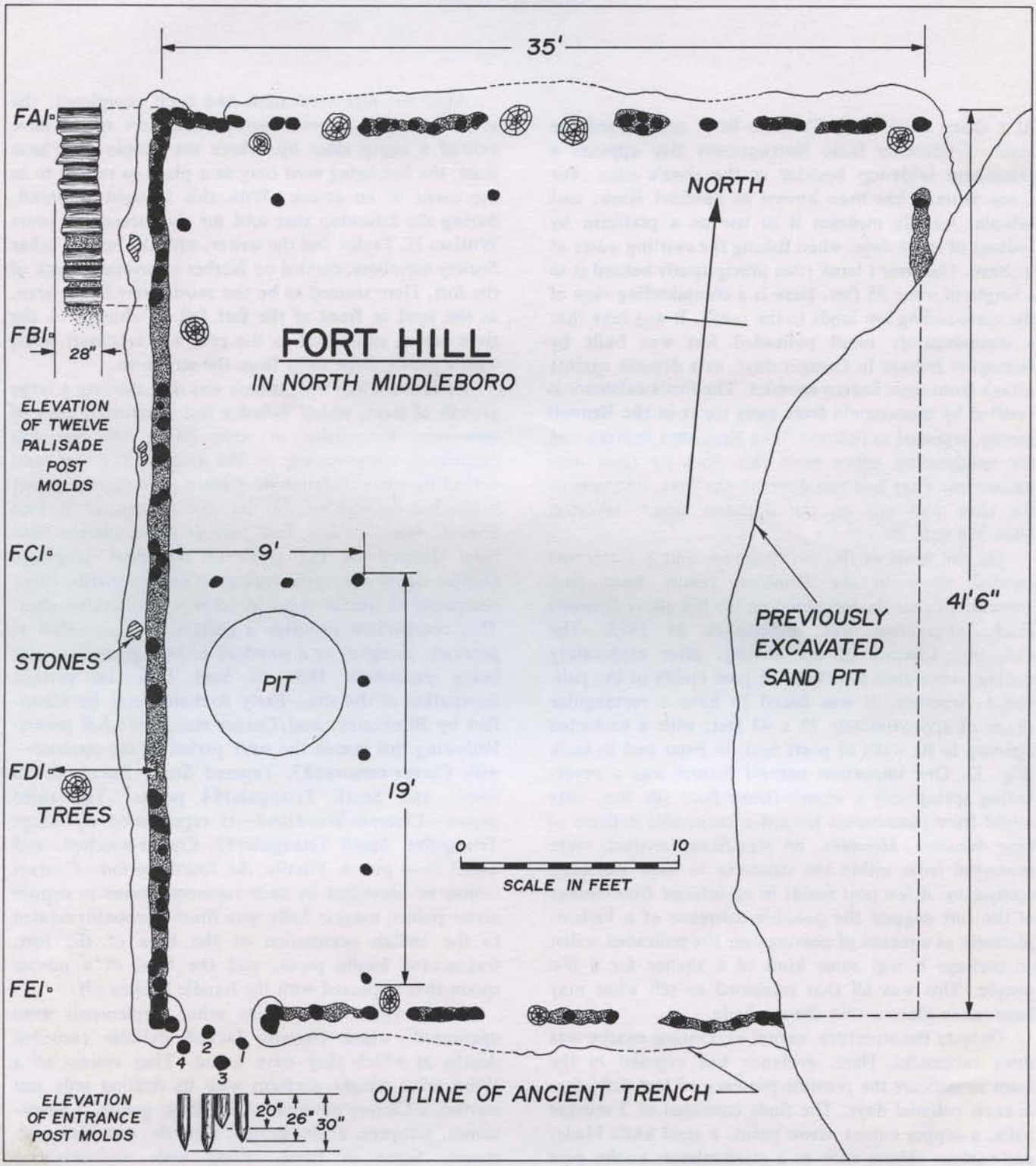

Fig. 1. Plan of excavated features at Fort Hill on Taunton River, as revealed by Cohannet Chapter excavations in 1952.

DISCUSSION

The Fort Hill Bluff site has always appealed to the writer because of its high elevation above the river, and because of the former existence there of a palisaded fort that gives it a mark of distinction. While it is true that remains of the fort are related only to the last, or Contact period, it is worthwhile to note, as a result of the subsequent bluff excavation, that the site had been occupied by people of every previous period except the Paleo-Indian. Quite obviously, this general approval of the location throughout the years was on account of its commanding view of the surrounding terrain, the nearby spring, and the Sentinel Rock fishing stand. This continuous use of the site has furnished our archeological research with typological evidence that parallels similar culture sequences found at other excavated sites in the area, notably Titicut that lies about a quarter of a mile down stream at tidewater. Much has been written and published in the Society Bulletin in the past about Titicut, with a radiocarbon date obtained there of 5,750 ±750 years ago.

However, perhaps that which is most striking about the site on the bluff is evidence there revealing the former presence of the fort. This is a unique feature seldom found, and it excites one's imagination as to what may have occurred that caused it to be constructed. Since it belonged to the protohistoric period, it was a product of local Indian engineering, built as a means of defense against attack by enemies. Its construction may have been incited by Iroquoian Mohawk raids—known to have reached this far into New England—as well as by those of the coastal Narragansetts. Actual accounts of how it served in times of attack are lacking, except for one that may be worth relating. Derived from Thomas Weston's *History of the Town of Middleboro,* it recounts an early story that has come down in the Bennett family of an attack on the fort that was averted in an ingenious way, if the story can be believed as something more than fiction (398 note 2).

Remember that the fort had two entrances, one toward the river and one on the opposite side. The tale goes as follows:

> One day they [Nemaskets] were surprised by a formidable force of Narragansett Indians with whom they were at war at the time. Unfortunately, there were only eight men in the Fort. The others were hunting and fishing. What, therefore, now to do they could not tell, but something must be done and that immediately. Therefore, every Indian bound on his blanket

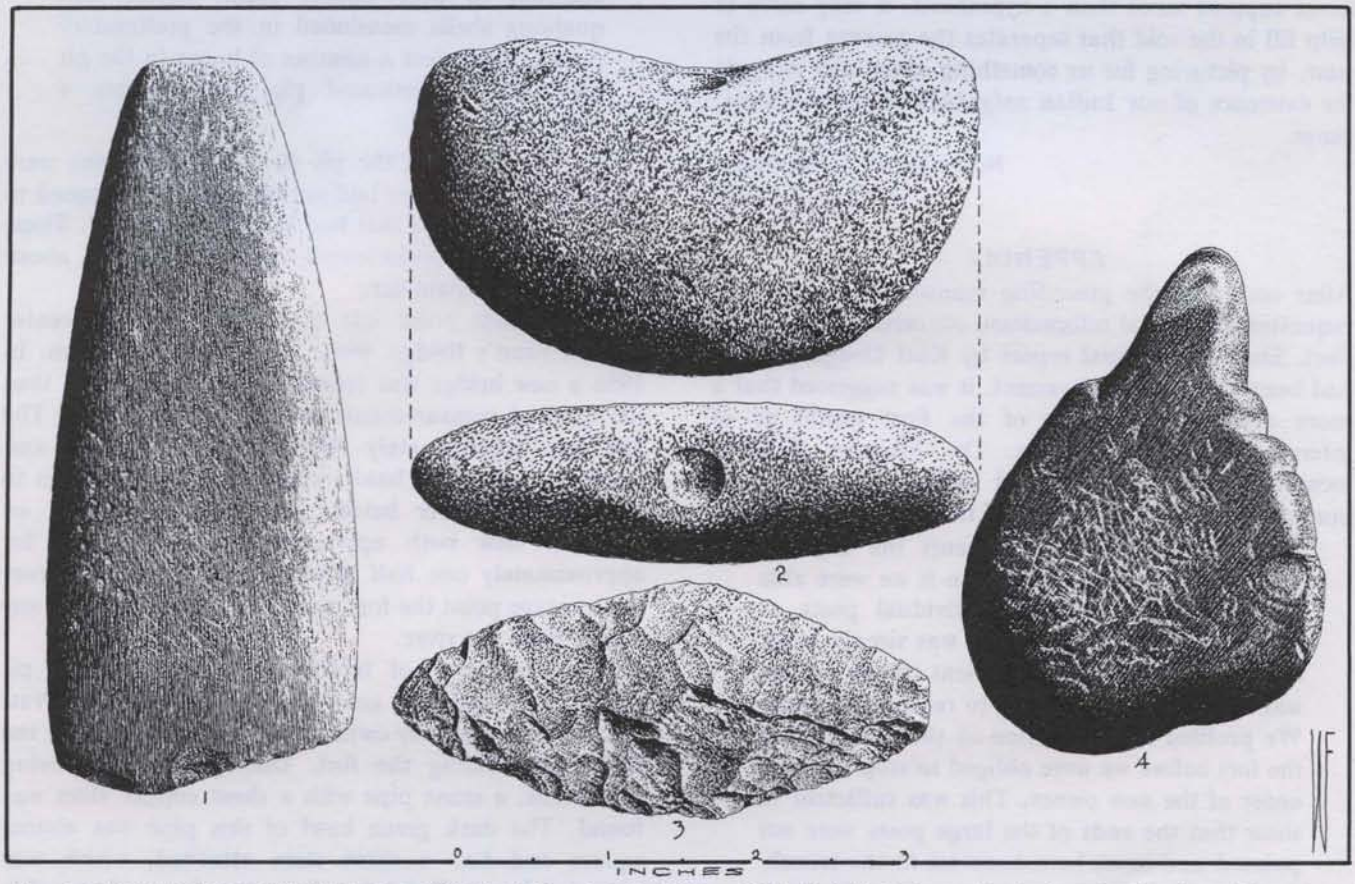

Fig. 2. EXCAVATED RECOVERIES, Fort Hill Bluff Site. 1,Celt; 2,Wing Atlatl Weight Preform (start of perforation by stick-and-sand abasion, showing); 3,Stem Knife; 4,Sinewstone.

V.38 #172

and arrows and took his bow and rushed out of the back door through the bushes and down the bank to the river. Then by the river, in the opposite direction from their enemies a small distance, then ascended the bank in sight of their enemy, then rushing in through the Fort and down the bank again, then up the bank and through the Fort as before. This round of deception they continued until the enemy, being surprised that the Fort consisted of so formidable a number, left the ground precipitately and retired, fearing an attack from the vast number in the Fort.

Archaeologically, what may relate to such defensive action are the copper cutout arrow points, musket balls and gun flints found outside the fort. From this evidence it may be that beside the bow-and-arrows of the Bennet account a flintlock gun or two, obtained from the English may have been present. Moreover, our bluff excavation that uncovered remains of a camp directly behind the fort, containing artifacts of Contact days, strongly suggests that here may have been the wigwams in which the defenders of the fort lived.

While evidence of the kind found in this report may never support more than a hypothesis, it may serve to help fill in the void that separates the present from the past, by picturing for us something about the struggle for existence of our Indian neighbors of early Historic times.

North Middleboro, Mass.
October 20, 1974

APPENDIX

After reviewing the preceding manuscript, the Editor requested additional information concerning the Indian Fort. Since the original report by Karl Dodge in 1953 had been a preliminary account, it was suggested that a more detailed description of the Fort would be of interest to M.A.S. readers. Dr. Maurice Robbins located the old records and offered the following comments and interpretation of the excavation:

The dark line which represents the old line posts is shown (Fig. 1). Within it we were able to discern a number of individual posts as indicated, the rest of the line was simply black earth and charcoal. The ancient trench outline was apparently a ditch dug to receive the posts. We profiled only a portion of the west side of the fort before we were obliged to stop work on order of the new owner. This was sufficient to show that the ends of the large posts were not pointed and must have been set in the trench. Apparently the posts were set against the back edge of the trench which was then refilled, probably leaving an embankment on the out side of the walls. The posts shown in the doorway were pointed and evidently driven. There are many gaps in the line of the stockade. These were probably made by trees or other natural disturbance. The earth had been previously removed in the area indicated, thus nearly obliterating the east wall of the stockade.

It seems to me that there is a good possibility that the stockade was burned, thus leaving the dark line of charcoal to mark the walls. The gaps may have been portions that did not burn and were later pulled down and removed; this eliminated the trench in that area and left no trace of the posts. This is, of course, merely a guess. Possibly the interior posts represent a structure along the inside walls, a sort of narrow platform from which one could shoot at anyone outside the wall. The rectangular outline may be that of a shelter, but may also be simply a firing platform. The large pit beneath this structure was about 6½ ft. in diameter and about 4 ft. deep at the center. In addition to deer bones, clam, oyster and quahoug shells mentioned in the preliminary report, there were a number of bones in the pit from the domesticated pig and possibly a sheep.

At the bottom of the pit 40 or 50 silver pins were discovered. These were laid out in a row, as if pinned to a sheet of cardboard that had long disintegrated. These pins were 3/4 inches in length with a round head, about 1/16 inches in diameter.

The datum point was measured from the center span of Pratt's Bridge, some 1200 feet downstream. In 1956 a new bridge was erected on the same spot, thus the original measurements are no longer precise. The fort was approximately 35 feet above the river and located atop a high bank, which falls steeply down to the Taunton River below. This position offered an excellent view both upstream and downstream for approximately one half mile in each direction. From this vantage point the fort was easily defended from any attack from the river.

One final note of interest concerns the sand pit which destroyed the east stockade wall. The Pratt family, who originally owned this land, once farmed the fields surrounding the fort. During gravel removing operations, a stone pipe with a sheet copper stem was found. The dark green bowl of this pipe was almost square and had a short stem attached, which was extended by a rolled tube of copper. I was shown this rare find almost 30 years ago; it is now in the collection

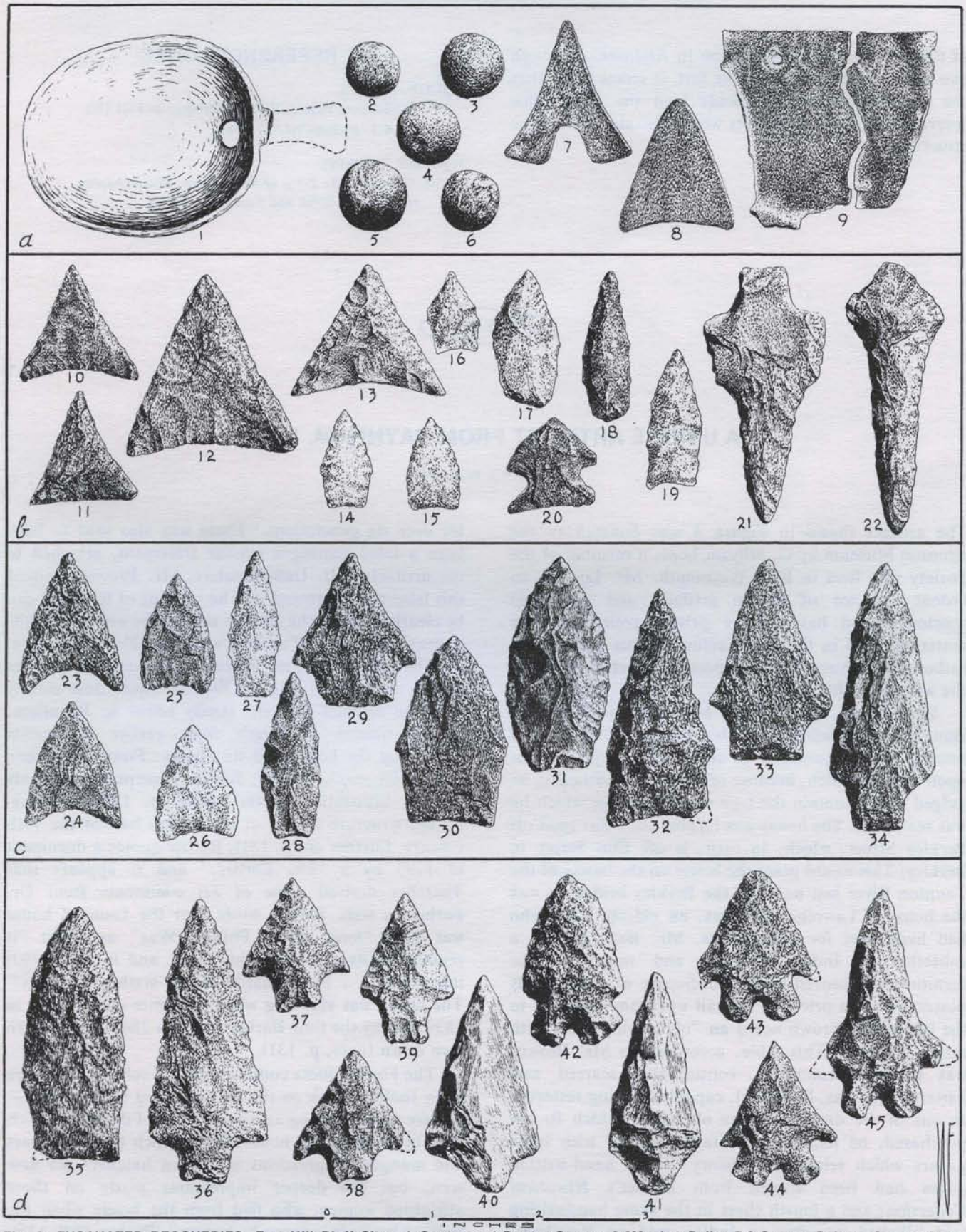

Fig. 3. EXCAVATED RECOVERIES, Fort Hill Bluff Site. a) *Contact* - 1,Pewter Spoon; 2-6Musket Balls; 7,8,Copper Points; Copper Piece Remains . . . b) *Ceramic-Woodland* - 10,11,Small Triangular#5, 12,13,Large Triangular, 14-18,Small Stem, 20,Corner-notched Points; 21,22,Cross Drill . . . c) *Late Archaic* - 23-26,Small Triangular#4,27,28,Small Stem, 29,33,34,Corner-removed#7, 30,31,Tapered Stem, 32,Eared#4 Points . . . d) *Early Archaic* - 35,Corner-removed#2, 36-39,Corner-removed#5, 40,41,Corner-removed#9, 42-45,Bifurcated Points.

of the R.S. Peabody Foundation in Andover. Although two other sandpits are near the fort, it seems likely that the one adjoining the stockade held the pipe, since several other contact artifacts were excavated within the structure.

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A UNIQUE ARTIFACT FROM RAYNHAM, MASS.

MAURICE ROBBINS

The artifact shown in Figure 4 was donated to the Bronson Museum by G. Stinson Lord, a member of the Society who lives in East Weymouth. Mr. Lord is an ardent collector of Indian artifacts and geological specimens and has a large private collection. The materials used in the manufacture of this artifact, its rather unique history, and its possible function warrants the writing of this paper.

Some years ago (1950), Mr. Robert Brown of Hanover, Massachusetts, who made a business of touring the back-country in search of antiques, came upon a house which, because of its evident antiquity, he judged might contain the type of material for which he was searching. The house was located on a dirt road off Berkley Street, which, in turn, is off Elm Street in Berkley. This would place the house on the banks of the Taunton River just north of the Berkley bridge. It was the home of Lawrence Barrows, an elderly man, who had lived here for many years. Mr. Barrows had a collection of Indian artifacts and much antique furniture and proved willing to dispose of some of his possessions at a price. In a small workshop adjacent to the house Mr. Brown noted an "old sewing table with many drawers." This table, according to Mr. Brown, was in poor condition, considerably scarred and battered, but was, he judged, capable of being restored. In one of the drawers of the old table, which Brown purchased, he found the artifact, together with some papers which related its history. Three hand-written pages had been copied from Barber's *Historical Collections* and a fourth sheet in the same handwriting said "Picked up after an Indian raid on Raynham, Massachusetts, on the banks of the Taunton River, during King Philip's War, 1675, and kept in one family for over six generations."There was also said to have been a label bearing a similar statement, attached to the artifact itself. Unfortunately, Mr. Brown removed this label and destroyed it. The imprint of the label can be clearly seen on the reverse side of the artifact; it was approximately 3/4 of an inch wide and 2½ inches long.

The quotation from Barber's *Historical Collections* (1840) appears on pages 130-131, which deal mostly with the original Leonard family house in Raynham. Barber quoted at length from earlier documents describing the house and its history. From Thatcher's *Indian Biography* (1839), Barber excerpted comments and an illustration of the house (p. 130)—a many-gabled structure typical of the second half of the 17th century. Further on (p. 131), Barber quotes a document of 1793 by a "Dr. Forbes," and it appears that Thatcher derived some of *his* comments from Dr. Forbes as well. Forbes wrote that the Leonard house was built "long before Philip's War" and that "it remains in its original gothic form, and is now [1793] inhabited . . . by Leonards of the sixth generation." The house was standing when Thatcher described it in 1839, but by the time Barber wrote in 1840, it had been torn down (note, p. 131).

The Forbes quote continues with a colorful reference to an Indian attack on the house during Philip's War—"There is yet in being an ancient case of drawers, which used to stand in this house, upon which the deep scars and mangled impressions of Indian hatchets are now seen; but the deeper impressions made on those affrighted women, who fled from the hosue when the Indians broke in, cannot be known" (Barber 1840:132).

The handwritten account of the axe's history, with its reference to six generations, must have been written

on or after 1840, when Barber's book was available for copying. The count of generations, therefore, long post-dates Forbes' 1793 "six generations" for the Leonard family, but it may well be a romantic (not historically accurate) allusion to the Leonards. We can speculate that Mr. Brown's scarred and battered "old sewing table with many drawers" just might have been the same as Dr. Forbes' "ancient case of drawers" with "the deep scars and mangled impressions of Indian hatchets." Remember that the case of drawers was no longer in the Leonard homestead in 1793. I prefer to assume that the pieces are one and the same, and that the artifact, together with the identifying papers, remained in the drawer to be found by Mr. Brown. Somehow the table and its contents, removed from the Leonard house, found its way via Barrows to Brown, and the artifact, eventually, to Mr. Lord. As the Leonard house was standing in 1839, it was obviously not destroyed during the Indian raid in 1675. Possibly, after the raid, the Leonards picked up the artifact in the vicinity and preserved it. We wonder if Mr. Brown restored the old table, covering up the "deep scars and mangled impressions," thus destroying a most interesting antique from the seventeenth century.

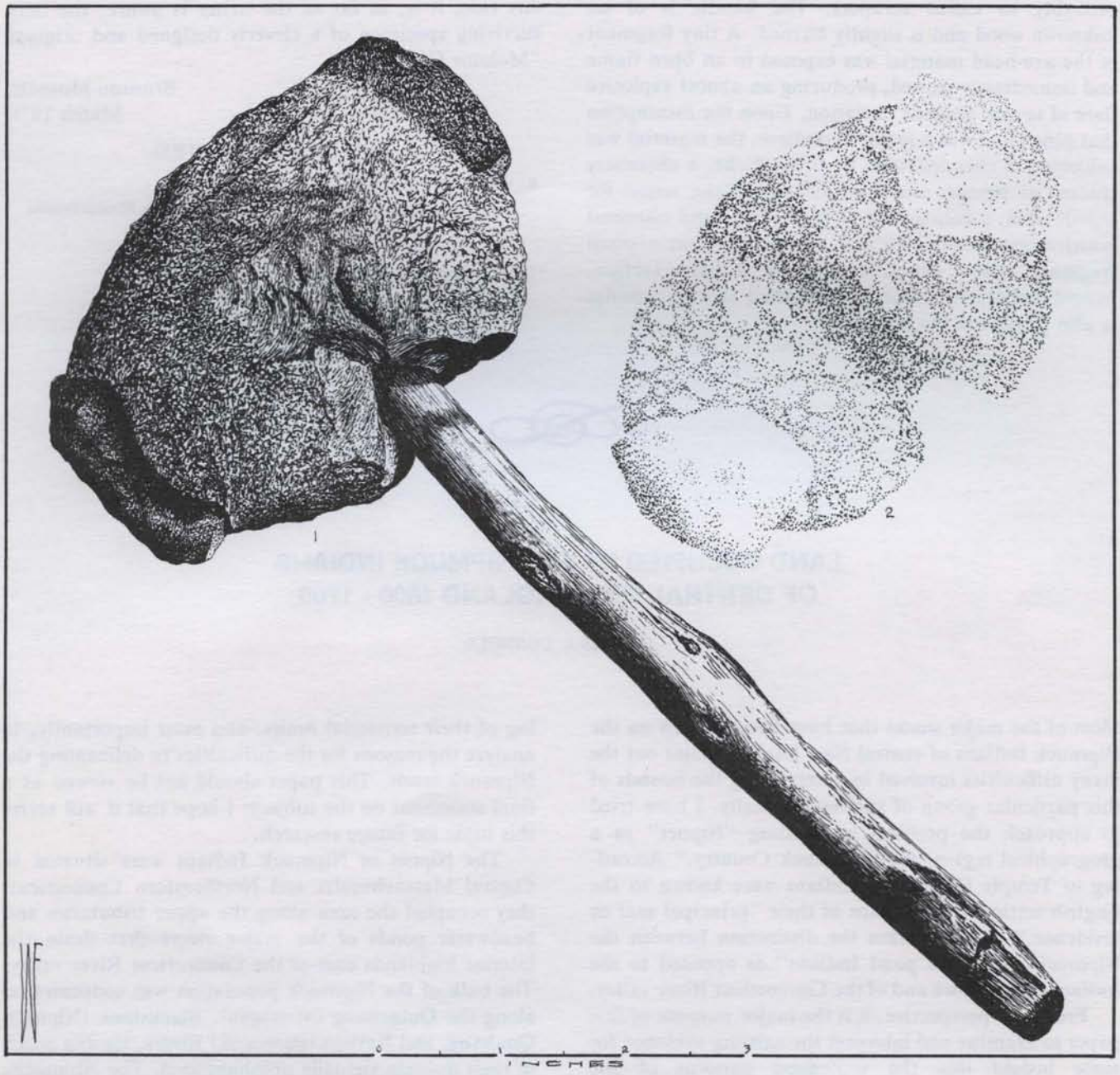

Fig. 4. Axe-like implement from Raynham. A rendering of an X-ray of the implement is shown to the right.

When the artifact was given to the museum it was described as a "Pottery axe." The material which composes the head of the "axe" does have the color and texture of local aboriginal pottery. However, as it would fracture with the first blow if used as an axe, some other function is suggested. An X-ray established that the stone blades which appear at either end are inserts, held in place by the plastic material of which the head is composed. The shadow illustration at the right of Figure 4 is a reproduction of the X-ray plate. The stones have been worked to an edge and are fragments of porphyritic felsite which, if found by themselves, would probably be called scrapers. The handle is of an unknown wood and is slightly burned. A tiny fragment of the axe-head material was exposed to an open flame and immediately ignited, producing an almost explosive flare of several seconds' duration. Upon the assumption that pine pitch was a major ingredient, the material was subjected to chemical tests by Brian Fiske, a chemistry student at Bridgewater State College. Fiske tested for abietic acid, a constituant of pine pitch, and obtained positive test results. Because of the fact that a small fragment, when struck sharply on a hard surface, caused a sharp explosion, it is inferred that gunpowder is also present in the mixture.

The conclusion of this writer is that this artifact is indeed the artifact picked up after the Indian raid of 1675, probably by a member of the Leonard family, and preserved by them "for over six generations." A better description of its function would be that it was an incendiary implement to set fire to a house under attack. It is possible that the stone inserts were intended to act as a "flint and steel" sparking device, or they may been intended simply to catch in the thatch of a roof and retain the torch in place long enough to fire the roof. The artifact may have been dropped accidentally or it may have failed to ignite for some reason. At any rate, it is, as far as the writer is aware, the only surviving specimen of a cleverly designed and original "Molotov Cocktail."

Bronson Museum
March 1976

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LAND OCCUPIED BY THE NIPMUCK INDIANS OF CENTRAL NEW ENGLAND 1600 - 1700

DENNIS A. CONNOLE

Most of the major works that have been written on the Nipmuck Indians of central New England point out the many difficulties involved in determining the bounds of this particular group of natives. Basically, I have tried to approach the problem by treating "Nipnet" as a geographical region, the "Nipmuck Country." According to Temple (1887), the Indians were known to the English settlers by the place of their "principal seat or residence," and he makes the distinction between the Nipmucks or "fresh pond Indians" as opposed to the Indians of the shore and of the Connecticut River valley.

From this perspective, it is the major purpose of this paper to examine and interpret the existing evidence for some insight into the settlement patterns of the Nipmuck peoples and to arrive at a clearer understanding of their territorial limits, and most importantly, to analyze the reasons for the difficulties in delineating the Nipmuck lands. This paper should not be viewed as a final statement on the subject; I hope that it will revive this topic for future research.

The Nipnet or Nipmuck Indians were situated in Central Massachusetts and Northeastern Connecticut; they occupied the area along the upper tributaries and headwater ponds of the major rivers that drain the interior highlands east of the Connecticut River valley. The bulk of the Nipmuck population was concentrated along the Quinebaug (Mohegan), Blackstone (Nipnet), Quabaug, and Nashua (Penecook) Rivers, leaving much of their domain virtually uninhabitated. The Nipmucks were a semi-migratory people living "about a place,"

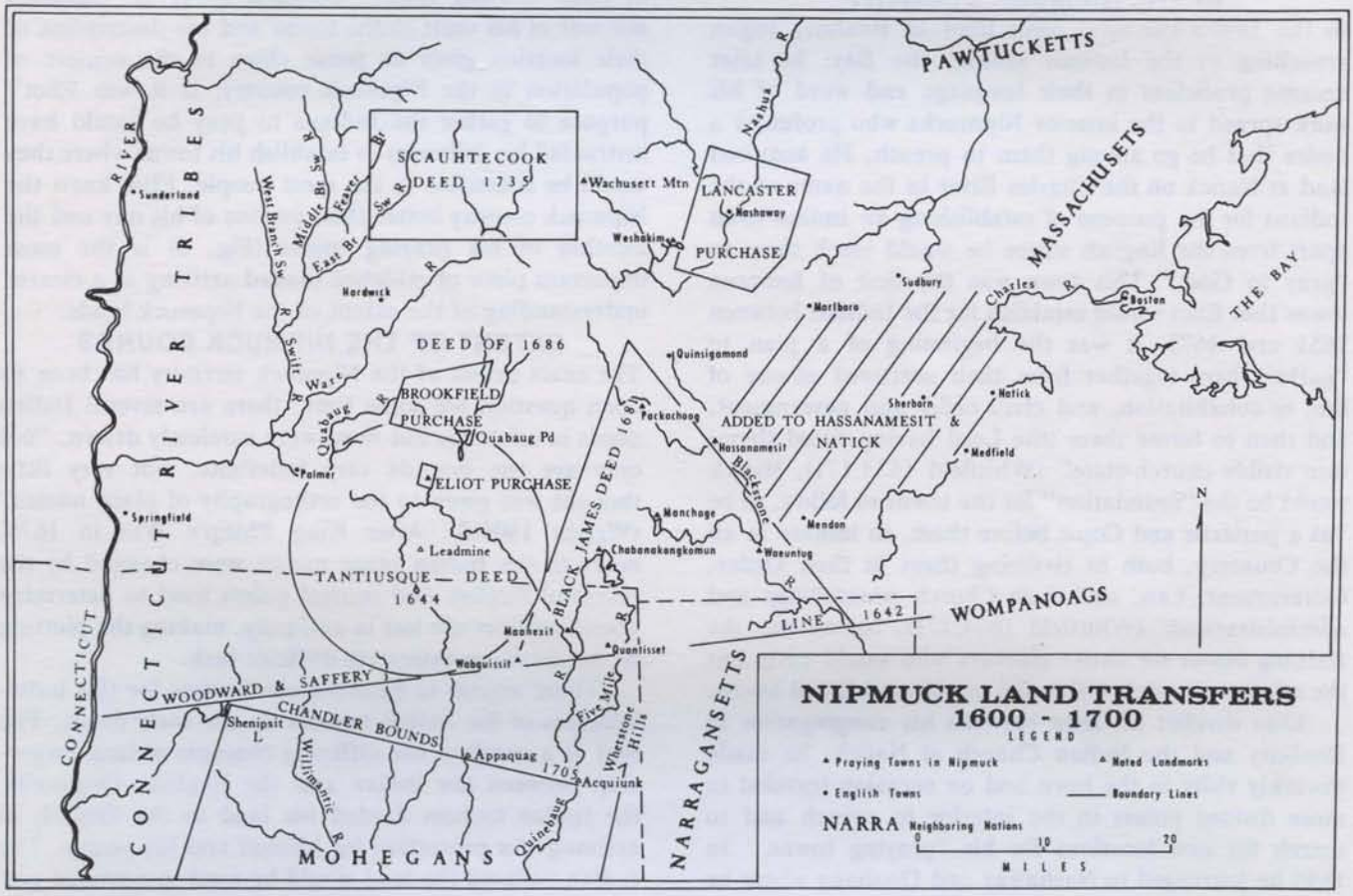

Fig. 5. Map of Nipnet showing recorded native land transfers.

moving frequently and usually occupying the most favorable location depending on their needs or the season of the year. The economy of the Nipmucks was primarily one of fishing and agriculture, the rivers providing them with an abundance of migrating fish in the spring and fall, and the valleys with rich bottom land for their corn.

The earliest English settlers of Massachusetts Bay had little knowledge of the interior woodlands between the Connecticut River and the Bay and consistently referred to this unknown region as "Nipnet," "Neipnett," or some derivative of the word and to the Indians of this region as "Nipnets" or "Neepnet men." John Eliot by his own words "the first that ever was among them," wrote in 1651, "there is a great Countrey lying between Conectacott and the Massachusets, called Nipnet, where there be many Indians dispersed" (Whitfield 1834:170-1).

Roger Williams was the first to refer to them as "Neepmucks" in a letter to Governor John Winthrop dated June, 1637, and he used this variation in subsequent correspondence with Winthrop. In a letter dated July 15, 1637, which contains a report on the "Neepmucks," Winthrop had "labelled it, - 'Mr. Wms about Wequash and the Neipnetts' " (Williams 1846:301). Williams used the suffix-*uck* in describing "particular names, peculiar to severall Nations of them amongst themselves (all N.E. Indians), as, Nanhigganeuck, Massachuseuck, Cawasumseuck, Cowweseuck, Quintikoock, Qunnipieuck, Pequttoog, &c." (Williams 1973:85). The Nanhigganeuck" referred to all of the people in the "Nariganset Country." This suffix was a variation in the language that can be attributed to the "Narroganset Dialect" in which the book was written. Williams used "Neepmuck" in reference to the people, and the country, "toward Neepmuck." Nipmuck and Nipnet were used interchangeably in the early records until the late 1660's when the name Nipmuck or Nipmug prevailed (see Appendix).

From the early records we learn that the "Nipmuck Country" was populated by small clans, not united under one chief sachem but free and independent peoples subject to lesser sachems and living at distinct localities within the Nipmuck region. Having no names for themselves, they became known only by the region in which they resided.

CENTERS OF POPULATION IN THE NIPMUCK COUNTRY

In the 1640's the Rev. John Eliot of Roxbury began preaching to the Indians around the Bay; he later became proficient in their language and word of his work spread to the interior Nipmucks who professed a desire that he go among them to preach. He acquired land at Natick on the Charles River in the name of the Indians for the purpose of establishing an Indian town apart from the English where he would teach them to "pray to God." This town was the first of fourteen towns that Eliot would establish for the Indians between 1651 and 1675; it was the beginning of a plan to "gather them together from their scattered course of life, to cohabitation, and civill order and government, and then to forme them (the Lord having fitted them) into visible church-state" (Whitfield 1834:171). Natick would be the "foundation" for the towns to follow, to be "as a patterne and Copie before them, to imitate in all the Countrey, both in civilizing them in their Order, Government, Law, and their Church proceedings and administrations" (Whitfield 1834:171). Natick was the training center for native teachers who would carry out the missionary work within the newly established towns.

Eliot divided his time between his congregation in Roxbury and the Indian Church at Natick; he made biweekly visits to the town and on occasion traveled to more distant points in the interior to preach and to search for new locations for his "praying towns." In 1649 he journeyed to Nashaway and Quabaug where he "found sundry hungry after instruction" (Whitfield 1834:125). In 1652 he traveled to the "Quinnubboag river" in the southern part of the Nipmuck country, going some 60 miles into the interior where he was well received and "accepted."

In 1654 Eliot petitioned for and was granted land at Nashoba, Okommakamesit (Marlboro), and Hassanamesit (in the Nipnet, now Blackstone, River valley) for the building of towns to accommodate his work. It was not, however, until 1671 that the establishment of praying towns in the Nipmuck country began in earnest; that year a second church was built at Hassanamesit on the "Nipmuk river" (Eliot had two churches and fourteen praying towns) and by 1673 a total of nine praying towns had been established there. Gookin, in his "Historical Collections," lists seven, Manchage, Chabanakongkomun, Maanexit, Quantisset, Wabquissit, Packachoog, and Waeuntug, but then notes, "There are two other Indian towns, viz. Weshakim (near Nashaway) and Quabaug, which are coming on to receive the gospel; and reckoning these, there are nine in the Nipmuck country. But they being not fully settled, I omit them" (Gookin 1970:87). In September 1674 John Eliot and Daniel Gookin (appointed by the General Court in 1661 as magistrate of the Indian praying towns) traveled to some of the towns to "settle teachers . . . and to establish civil government among as in other praying towns" (Gookin 1970:79). Gookin's account of his visits to the towns and his description of their location gives us some clues to the centers of population in the Nipmuck country; if it was Eliot's purpose to gather the Indians to pray he would have instructed his followers to establish his towns where they would be accessible to the most people. Eliot knew the Nipmuck country better than anyone of his day and the location of his praying towns (Fig. 5) is the most important piece of evidence toward arriving at a clearer understanding of the extent of the Nipmuck lands.

EXTENT OF THE NIPMUCK BOUNDS

The exact extent of the Nipmuck territory has been an open question for some time; there are several Indian deeds in existence but most were carelessly drawn, "not only are the bounds very indefinite, but very little thought was given to the orthography of place names" (Wright 1905:8). After King Philip's War in 1675, many of the Indian place names were changed by the resentful English and control points used to determine boundary lines are lost in antiquity, making the plotting of the deeds an extremely difficult task.

There appear to be two major factors for this indefiniteness of the Indian bounds on the early deeds. The first is a result of the differing concepts of land ownership between the Indian and the English. Originally, the Indian sachem deeded his land to the English in exchange for protection for himself and his people. The Indian believed the land would be used in common and most deeds reserved the right to hunt, fish, plant at convenient locations, set their wigwams and use the woodland trees for firewood. It appears that in some cases the English were well aware of the Indian intent to share the land without giving clear title; in numerous cases they paid for the same piece of land two or more times. Upon the death of a ruling sachem the English would obtain confirmation of an existing deed from the succeeding party with payments in money and goods. Under this agreement the sachems were willing to allow the English access to large tracts of land and in some instances their entire domain.

In the conveyance of such large tracts of land to the English it was nearly impossible to cite exact boundaries in every instance, and so the Indian sachems used the most notable landmarks—large rivers, the confluence of two streams, the falls of a river, high hills, and major trails—as control points. Boundaries were by no means precise and were not intended to be exact or definite. Later deeds stipulated the right of the sachem to a particular tract of land within the territory sold while relinquishing all claims and titles to the land.

Secondly, the land between the major river valleys where the Nipmucks were concentrated was of little use to the Indians and they considered it for the most part wasteland. There were great expanses of such wasteland

between all the Nipmuck clans and also between neighboring nations. These areas were populated by a few Indians who lived as "newters" not belonging to any of the major Nipmuck subdivisions. These expanses of wasteland made it unnecessary for precise lines of demarcation between many of the central New England tribes.

NIPMUCK DEEDS BEFORE 1675

The earliest known deed of land was conveyed by the sachem of Tantiusque to John Winthrop on August 8, 1644. Winthrop's interest was in the blacklead (plumbago) that had been discovered there. The deed included "all lands in the wilderness lying north and west East and South round the said Black lead hills for ten miles each way" (Wright 1905:17). The tract included all of the headstreams of the Quinebaug River and its northern extent very closely approximated the southern line of a tract purchased by the founders of Brookfield Plantation on the Quabaug River in 1665, the southern limits extended to the Woodward and Saffery Massachusetts south line (see Trumbull 1818:-185-6) that was established in 1642.

LANCASTER PURCHASE

In 1643, Henry Symonds and Thomas King purchased from a sachem of Nashaway, a piece of land eighty miles square on the "Nashaway River, at the passing over to be center, & five miles north, five miles south, five miles east & three miles west" (Nourse 1884:22); no record of a deed exists. In 1653 the General Court recognized the purchase and appointed some commissioners to lay out the bounds for a town to be "Henseforth called Lancaster." This directive was not completed until 1659 by Ensigne Thomas Noyes and a report was submitted to the court on April 7, 1659. The southern line of the purchase ran 6½ miles from the west line and came upon and met with a line of "the plantation granted to the petition of Sudbury whos plantation is called Whipsuffrage . . ." (Marlboro) and followed the nor west Angle of Whipsuffrage" (Nourse 1884:65) until it met with the east bounds of the Lancaster purchase. This was the only sale of land by the sachems of Nashaway before 1700.

ELIOT PURCHASE

In 1655, John Eliot purchased 1000 acres of land from a sachem of Quabaug with plans of settling an Indian town there.

> It was in furtherance of this plan that Mr. Eliot petitioned the General Court, in 1644, for a large grant of land, which should take in his purchase of 1655. The record is: 'In answer to the petition of Mr. John Elljott in behalfe of the Indians of Putikookuppogg, the Court judgeth it meete to grant this petition: vizt, a plantation to the Indians, not exceeding fower thousand acres, and that it prejudice nott Ipswich grant (at Brookfield), or any former grant, in the place desired nere Quoboag (Temple 1887:42).

The court commissioned several men to determine the "sittuation and limits" of the requested land grant. This tract is clearly within the bounds of the Tantiusque deed of 1644 (see map) and it is possible for this reason no other record of Eliot's petition exists. On December 5, 1715, the title to the original 1000 acres "was confirmed by the General Court to the heirs of Mr. Eliot" (Temple 1887:41).

BROOKFIELD PLANTATION

On November 10, 1665, several inhabitants of Ipswich purchased from the Indians of Quabaug, a tract of land for the plantation of Brookfield (permission for settlement was granted by the General Court on May 31, 1660). The tract was located just north of the Tantiusque deed of 1644, named on the deed as the southern bound was "a hill called Asquoash" that is on the divide between the Quinebaug and Quabaug Rivers. It included meadow land on both sides of the Quabaug River from Quabaug Pond westward to the tributary of Naltug Brook now called Deans Brook in Warren (for a map of this tract see Temple 1887:55). These are the only existing records of land transactions in the Nipmuck country prior to King Philip's War.

NIPMUCK DEEDS AFTER 1675

Before King Philip's War of 1675-6, there were only scattered settlements of English in the Nipmuck country, at Lancaster (Nashaway), Mendon, Quinsigamond (Worcester), and Brookfield. When the war began some of the Nipmuck sachems joined with King Philip and attacked these scattered outposts, which were later abandoned. The praying Indians in the Nipmuck country were ordered to Natick where they were brought to the Bay for evacuation to the islands in the harbor; those who chose to remain were hunted down and killed or taken captive and sold into slavery by the English while other fled westward across the Connecticut River or into Canada. In the Spring of 1676, they were allowed to return to their plantations and a handful returned to Hassanemesit to plant.

The war in the Nipmuck country ended with the death of King Philip in August, 1676 and settlement of the area began again. With the Indians no longer a formidable force in the region the English began a concentrated effort to obtain all of the unoccupied lands. They made treaties with the Indian claimants and came to terms for the land.

BLACK JAMES DEED

The largest tract of land was deeded to Joseph Dudley and William Stoughton from "black James of the Nipmug Country." In 1674, Black James was residing at Chabanakongkomun, a year before he was named constable of all the new praying towns in the Nipmuck country (Gookin 1970:80). After King Philip's War he emerged as chief sachem of the remaining Nipmucks.

In 1681 Dudley and Stoughton were appointed by the General Court "to inspect the clajmes of the remayning Indians to lands in the Nipmug Country" (Shurtleff vol.V 1854:328). In June, a meeting was held in Cambridge Village to review the Indian claims and the Rev. John Eliot was enlisted to "assist in interpretation & better understanding of their severall pleas" (Shurtleff vol. V 1854:328). This matter attended to, a personal inspection of the land was made and reported on to the court, the area in question was further clarified in a later report. After the initial report was submitted, Dudley and Stoughton were ordered by the court to come to terms for a full surrender of the lands.

Several treaties were made and the final report was forwarded to the court on March 17, 1681-82 wherein the region was divided into four parts. The report concluded "that the Hassanemesit and Natick Indians shall have added to the sajd plantation of Natick and Hassanemet . . . all that remayning wast lands lying betweene those two plantations & adjoyning to Meadfeild, Sherborn, Mendon, Marlborow, & Sudbury, being wast & of very inconsiderable value. The remainder of their clajme, lying fower miles northward of the present Springfield road, & southward to that" (Shurtleff vol.V 1854:342). This portion, lying westward of Hassanamesit and adjoining Nashaway, was claimed jointly by the Hassanamesit Indians at Natick and Black James who came to agreement among themselves for the sale of this tract. The Hassanamesit Indians were residing at Natick Plantation for protection against the Mohawks who made frequent raids into the region after King Philip's War.

The lands south of Hassanamesit to the Massachusetts south line, including lands at Maanexit and Quinetisset, were claimed solely by Black James and his followers. Both sections claimed by Black James were later annexed; they included all the land,

> beyond (west of) the great ryver called Kuttatuck or Nipmug Ryver, and betweene a rainge of marked trees, beginning at the sajd river, and runing south east till it fall upon the south lyne of the sajd Massachusetts colony on the south, and a certeine imaginary ljne fowre miles on the north side of the road, as it now ljeth, to Springfield (through Worcester, ordered laid out December 23, 1673 by the General Court) on the north. (Shurtleff vol.V 1854:362).

This puts the northern boundary at the drainage divide between the Nashua and Blackstone Rivers. From this point the western bounds angled to the southwest until it met with the Massachusetts south line as defined by Woodward and Saffery in 1642; on the map this line is extended to meet the boundary line of the Tantiusque deed of 1644, "the whole tract in both deeds conteyned is in the forme of a trjangle" (Shurtleff vol.V 1854:342). Of this tract, Black James received, for himself and his followers, two parcels of land "measuring the contents of five miles sq.; the one being at a place called Quanesusset, the other at a place called Mayanexet" (Shurtleff vol.V 1854:488). On November 10, 1682, Dudley and Stoughton purchased "five thousand acres at Quinnatisset and a large tract at Myanexet, being a moiety or full half of the whole Reservation, . . . for the sum of ten pounds" (Larned 1874:14). Dudley retained the land at Maanexet along the Quinebaug River. The five thousand acres at Quantisset "was soon made over to purchasers," it was "laid out in farms in 1684" but left unsettled for thirty years.

Black James and the remaining Nipmucks, established a village and erected a fort at the northern end of Webster Lake, probably at or near the location of the original praying town of Chabanakongkomun. In 1684 Eliot wrote to Robert Boyle that only four praying towns remained since the Wars—Natick, Wamesit (Lowell), Punkapaog (Stoughton), and Chabanakongkomun (Eliot 1794:185).

DEED OF 1686

The final tract of land, "the northern part, towards Wachuset, is yet unpurchased, & persons yet scarsly to be found meet to be treated with thereabouts" (Shurtleff 1854:342). It remained unpurchased until 1686 when the "Sons and heirs of black James" came forth to lay claims to this section. The bounds of this tract are very uncertain; its northern boundary is the "River Menamesick (Ware R.) & westerly by the River untill it come Against Quabaug bounds and Joynes unto their bounds, or however; or however otherwise butted or bounded" (Wright 1905:111); this places it between the Ware and Quabaug Rivers. The southeast bounds were the western bounds of the Dudley and Stoughton purchase of 1681-2.

The deed cites the Ware River as the northern boundary although it may have included lands beyond the river (but in the Ware River valley) to the northwest. The purchasers of this tract "began a settlement near Palmer. The purchase was made without the sanction of the General Court, and although in 1726-27, a petition was presented to the Court, confirmation was refused. After various petitions, in 1732, a grant of a tract six miles square was allowed which corresponds with the territory occupied by the town of Hardwick" (Wright 1905:113), west of the Ware River.

SCHAUHTECOOK DEED

There is a deed dated August 29, 1735, that helps to affix the northern boundary of the Nipmuck country. The region north of the Nipmucks was claimed and sold by the Schauhtecook Tribe who also sold land further north along the Connecticut River that extended east and west of the river some 20 miles into the interior.

This deed of land was situated,

> upon or by the Road that Leads from Sunderland to Lancaster and bounds West upon a Broad Brook (Feaver Brook) where are two Trees marked and peeled that runs between the middle and East Branch of Swift River Extending about Twelve Miles East and is bounded on a River that runs at the bottom of Wauchusetts (Wright 1905:129).

This tract extended five miles north and south from the marked trees (assumed to be where the road crossed Feaver Brook), and eastward from the brook to Wachusett Mountain that separates the Ware and Nashua River watersheds. On the map (Fig. 5) this deed was plotted from Osgood Carleton's *Massachusetts Proper* (1802).

THE SOUTHERN BOUNDS

To the south of the Nipmucks lived the Mohegans whose principal seat was at the mouth of the Quinebaug River. They controlled land along the Quinebaug as far north as Acquiunk, the upper falls in the Quinebaug and beyond. In 1704, Owaneco the son of Uncas, brought forward a claim to certain lands held by Connecticut and a survey was made in behalf of the Mohegans to recover the lands from the colony. The survey was completed in 1705 by John Chandler and a map drawn (Map of Mohegan Bounds). The northern boundary began in the Whetstone Hills (see map) in eastern Connecticut and ran southwest to Acquiunk, then NNW through Appaquag (a large meadow at the head of Little River that provided the Indians with reeds and leaves for their mat and basket weaving), and on to Moshe Nup Suck (Shenipsit Lake). From Shenipsit Lake the line ran southwesterly until it met with the Connecticut River. The Mohegans claimed the land to the south of this line as their "Hereditary country; and the Wabbequaset territory (the southern part of the Nipmuck country west of the Quinebaug River) which lay north of it, they claim by virtue of conquest" (Trumbull 1818:421).

The "Quinebaug Country," the most southerly part of Nipnet, was occupied by scattered Nipmucks (Quinebaugs) who "had no resident sachem and went as they pleased" (Larned 1874:3-4). The Quinebaugs paid tribute sometimes to the Narragansetts and sometimes to the Mohegans.

The northeast corner of Connecticut (south of the Woodward and Saffery line) between the Quinebaug River and the Colony of Rhode Island (line established 1703) was known as the "Whetstone Country." This region "lay remote from any public throughfare of travel" (Larned 1874:159), and remained unclaimed by the Indians; it later reverted to the Colony of Connecticut for disposal to interested settlers.

CONCLUSION

The key to the settlement patterns of the interior Nipmucks are the rivers, with habitations of a particular group located within the drainage basin of a major river tributary. The noted landmarks cited on most deeds were high hills, usually the drainage divide between two river systems with the Indians concentrated in the fertile valleys along the river.

As mentioned previously, the land between the major river valleys was of little value to the Indians and thus considered wasteland. The land area between Natick and Hassanamesit, later granted to the sachems of those plantations and the area included in the deed of 1686 that remained unclaimed by Black James but later sold by his "Sons and heirs", give evidence to this accord.

The lower reaches of the major rivers were controlled by the more powerful shore and Connecticut River tribes who exploited the Nipmucks, exacting tribute whenever possible; sometimes the Nipmucks paid tribute to one or more of these tribes to prevent reprisals. The dividing point between two groups occupying the same drainage basin was usually at the falls in the river where the upward migration of anadromous fish was halted or impeded, as in the case of the Mohegan northern bounds at Acquiunk on the Quinebaug and Ow-wae-nung-gan-nunck on the Willimantic River. Deeds by the Connecticut River sachems were confined to the valley and seldom extended beyond the flood-plain of the river. Generally speaking, the Nipmuck territory was sparsely populated compared with the shore and river Indians where the tribes benefited from a greater food supply and milder climate.

The land transactions presented here, are to the best of my knowledge complete. The deeds, however inadequate and badly recorded, are the only existing record of the extent of the land area once occupied by the Nipmuck peoples of central New England.

Worcester, Mass.
May 1976

APPENDIX

VARIATIONS ON NIPNET

Neipnett - Winthrop 1637 (Williams 1846:301), *Nipnet.* - Wood 1634 (Wood 1897:Appendix - The names of the Noted Habitations) and Eliot 1651 (Whitfield 1834:170), *Nipnett.* - Pynchon 1644 (Wright 1905:21), *Neepeneet.* - Morton 1636 (Morton 1883:270), *Neepnet.* - Williams ca. 1636 (Williams 1863:188).

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PORTABLE STRUCTURES AND WINTER ARCHAEOLOGY

BILLEE HOORNBEEK and CHARLES E. BOLIAN

A major problem that plagues the archaeology of northern New England is a very short field season. This problem will become more acute as the amount of contract and salvage archaeology increases. The climate will not change to meet our needs; archaeologists will have to change their techniques, since a delay in the timing of an archaeological salvage operation may cost a sponsor large sums of money. This point has been recently stressed by Ingleheart & Ingleheart (1974: 104-5) who suggest the use of polyethylene covered geodesic domes as portable structures which might be used for winter archaeology in New England.

We have recently completed a salvage contract at the Seabrook Station Site (NH 47-21). The dig began on October 6 and terminated December 5. Although an archaeological field project would not ordinarily have been undertaken at this time of year, the sponsor, Public Service of New Hampshire, was willing to design and construct portable structures which made fall and winter archaeology feasible.

Four square structures were built, each of which is approximately 12 feet on a side. The structures have frames of 3/4 inch aluminum conduit and are covered with 4 ounce corrugated fiberglass. The materials

needed for construction of each structure cost approximately $200.00, comparing favorably in cost to the wood and polyethylene structure constructed by Ingleheart & Ingleheart; however, the area covered is much smaller. The weight of each structure is approximately 160 pounds and they can be easily moved by three or four workers.

The frames are entirely covered with white translucent fiberglass except for 3 feet by 7 feet openings at each end for "doors". The doors are covered by multiple layers of clear polyethylene which could be locked in place (Fig. 6). The structures have a one-foot-long section of conduit extending out at each corner. These extensions provide convenient handles for moving the structures and they are also used to anchor the shelters against the wind. Large J-Bolts made of steel reinforcing rods were driven into the ground with the hook of the J-bolt hooked over the extension at each corner of the structure.

The structures are large enough to cover four 1½ meter squares plus space around each square for working. Although the buildings are only about 8 feet tall at the peak, the slope of the walls is such that there is sufficient head space for working in all parts of the structures. Digging was generally done on two diagonal squares, then stratigraphies were drawn and the other two squares were excavated. Two people worked well in a shelter, three was a bit crowded and one person tended to feel isolated. Doors at each end of the structures facilitated entry and exit for screening.

Although the structures were designed as protection from the cold, their first use was as protection against the fall rains. There was no necessity to suspend work no matter how heavy the precipitation. The shelters were found also to be ideal for cool windy weather. The sun warmed the structures sufficiently when there was protection from the chill winds. Everyone developed a new fall wardrobe which included long johns, gloves and insulated boots, a bit short on chic but long on comfort. Thus attired, the crew could work comfortably in the shelters without heat when the temperature was in the low forties.

After consultation with a local rental establishment we decided to use a gas generator to provide electricity and 50,000 BTU kerosene heaters for heat. These torpedo shaped heaters were placed just outside one door of the huts and aimed inside, being careful that they were not aimed at a person since the heat was intense. The heat was found to be entirely adequate at 15° Fahrenheit, which was the coldest daytime temperature during the dig. However, this manner of heating was ineffecient and troublesome because of mechanical failures with both the generator and the heaters.

The following changes are proposed for future work;

1. Shelters which would cover at least nine 1½ meter squares and allow for 5-4-5-4 grid system would necessitate far less movement of huts, and allow more freedom to follow features. This enlargment would also permit screening to be done under cover during extremes of cold and rain. Much larger units seem feasible. In such a situation it is felt that two or three small huts would also be necessary for use when there is only one pit left in an area. Thus, a large hut would not be tied up when it should be moved on.

Fig. 6. Portable Shelters in Late Fall Excavations, New Hampshire. Photo by John P. Adams.

2. The basic design appears to be sound. The rigid fiberglass covering is superior to polyethylene since it is less subject to damage by either vandalism or natural causes.(Fig. 6).

3. A more reliable heat source is needed. The heaters used were completely adequate but the generator broke down far too frequently. A cheap, simple heater which does not require a power source is now being investigated.

4. Bales of straw or hay should be used to prevent the ground from freezing overnight.

5. In an ideal situation, a nightwatchman would be employed so that the heaters would not have to be moved at night. On the coldest nights, if the heat could be kept on low in the huts or turned on an hour before the workday began, it would speed the start of the work in the mornings.

This project was blessed with a record-breaking mild fall which allowed time to solve the problems involved. With the groundwork now done there is no reason why fall and winter archaeology in New England should not be continued. There are indeed advantages to working in the field at this time of year; clear sunny days, less tourist traffic, very few mosquitoes and other insects and greater visibility as the trees lose their leaves.

The conclusion by those involved was that fall and winter digging in New England is entirely satisfactory. A deep stratified site where the huts could be left in place for longer periods of time would be ideally suited for winter work. Even in the shallow site such as Seabrook, where frequent movement of the huts was necessary, the use of plastic to keep the unopened pits covered kept the soil dry enough to work.

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University of New Hampshire
April 1976

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LITHIC ANAYLSIS OF A MUDSTONE/"ARGILLITE" WORKSHOP: THE WILLS HILL SITE

ALAN E. STRAUSS

The Wills Hill site in Montague, Massachusetts, was excavated as part of a large-scale environmental impact study and mitigation operation undertaken for the Northeast Utilities Corporation. Excavation of the site (Fig. 7) was undertaken between early August and middle September, 1975, under the direction of Peter A. Thomas, a doctoral candidate at the University of Massachusetts in Amherst. The date of the site, based on typological comparison, falls within the Middle Woodland period (Ritchie and Funk 1973:117-164). The site is located on a flat-topped ridge underlain by arkose bedrock. The cultural debris at the site was found within a six-inch depth of loamy sand.

The northern edge of the site, where a few scattered flakes had been found, was leveled by bulldozers prior to its discovery; it now consists of mixed sands and arkose rubble. The undisturbed portion of the site was covered with sparse vegetation and wooded with saplings and a few larger deciduous trees. The boundaries of the site were determined by the dramatic decrease in cultural debitage which occurred at the edge of the site, where arkose rubble was found in substantial quantities. These areas were not excavated due to the impregnability of the arkose and the paucity of cultural material. Test trenches were, however, dug in these peripheal areas to define the site boundaries. In all, thirty-five squares (5' x 5') were removed, resulting in a sampling of approximately 60% of the site. The basic excavation unit was a five-by-five foot square which was further subdivided into one-by-one foot square units (resulting in twenty-five units per square).

LITHIC ANALYSIS

At the outset it should be mentioned that archaeologists, on occasion, misuse geological terms. One example is the overuse of the term "argillite." Archaeologists have used the term to describe a wide range of different siltstones, claystones and mudstones. In the hand, argillites are virtually indistinguishable from sedimentary mudstones because of their similarity in structure and basic properties. "Argillites are high indurated (generally recrystallized) claystones and siltstones that break into angular fragments" (Compton 1962:219). Because argillites are mudstones and similar rocks that have undergone a gradual incipient metamorphisis, it is extremely difficult to draw a line separating the two. "Mudstone differs from argillite only in that the latter is tougher" (Spock 1962:209). Therefore, it is my belief that the term argillite should be applied specifically to those fine-grained siltstones and claystones that exhibit a definite metamorphisis, extreme toughness in comparison to mudstones, and a non-fissile cleavage when fractured. The other alternative is to disregard the term "argillite" altogether.

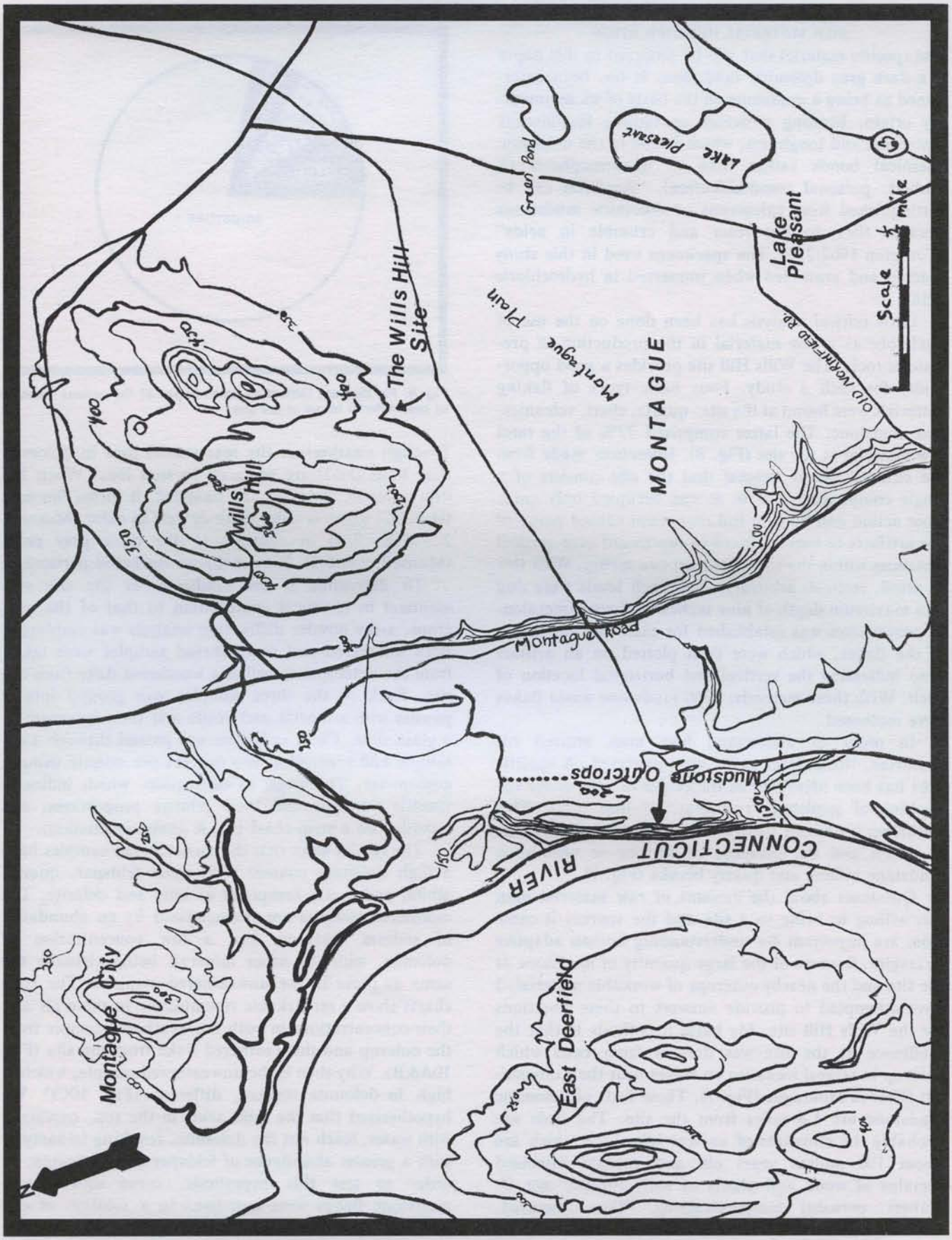

Fig. 7. The location of the Wills Hill site in Montague, Massachusetts and its relation to the mudstone outcrops.

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RAW MATERIAL IDENTIFICATION

The specific material that will be analyzed in this paper is a dark gray dolomitic mudstone. It has been determined as being a mudstone on the basis of its sedimentary origin, bedding structure containing fossiliferous materials, and toughness, which is due to the dolomitic chemical bonds rather than to metamorphosis (J. Hubert, personal communication). "Argillites can be distinguished from calcareous or dolomitic mudstones because they do not react and crumble in acids" (Compton 1962:219). The specimens used in this study reacted and crumbled when immersed in hydrochloric acid.

Little critical analysis has been done on the use of mudstone as a raw material in the production of prehistoric tools. The Wills Hill site provides a good opportunity for such a study. Four basic types of flaking materials were found at the site: quartz, chert, volcanics, and mudstone. The latter comprised 77% of the total raw material at the site (Fig. 8). Inferences made from the cultural debris suggest that the site consists of a single component, that is, it was occupied only once. Root action and natural soil movement caused many of the artifacts to move upward or downward over vertical distances within the soil of at least two inches. With this in mind, vertical, arbitrary, three-inch levels were dug to a maximum depth of nine inches. A three-dimensional provenience was established for each tool and many of the flakes, which were then plotted on an artifact map indicating the vertical and horizontal location of each. With these methods, 4360 mudstone waste flakes were recovered.

In order to understand how man utilized his resources, the artifact maps were analyzed. A specific area has been identified as the center of activity for the working of mudstone raw material into tools. This workshop is defined by overall distribution and density of debris and the presence of broken or unfinished mudstone bifaces and quarry blanks (Fig. 9).

Questions about the amount of raw material man was willing to bring to a site and the sources it came from are important for understanding human adaptive strategies. Because of the large quantity of mudstone at the site and the nearby outcrops of workable material, I have attempted to provide answers to these questions for the Wills Hill site. My basic hypothesis is that the mudstone at the site was derived from beds which outcrop in several locations on ridges near the Connecticut River in Montague (Fig. 7). These beds of dolomitic mudstone are 1.8 miles from the site. The beds are probably the remnants of ancient lake beds which are about 190 million years old and contain fossilized remains of wood and plants of early Jurassic age (J. Hubert, personal communication). When fractured, these mudstones produce conchoidal and subconchoidal fractures due to the bonding properties of the dolomite.

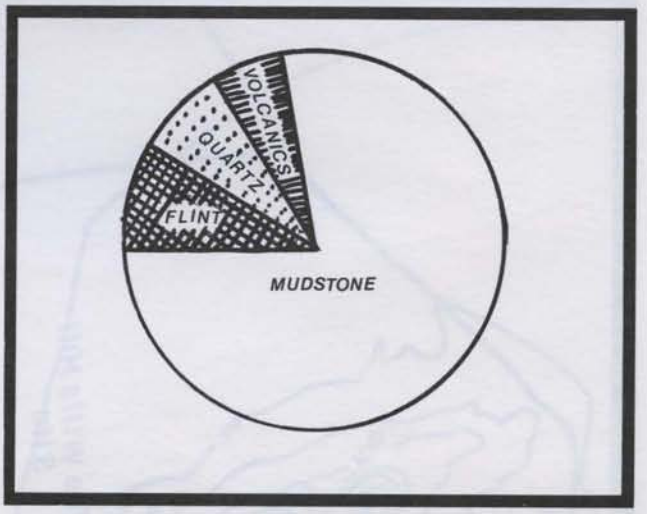

Fig. 8. Pie diagram indicating percentages of the various amounts of raw material found at the site.

Through weathering, the magnesium ions in dolomite (Ca, Mg(CO3)2) are replaced by iron ions. When the iron becomes hydrated and oxidized, it forms limonite (H FeO2) which is pale yellow or buff in color (Munsell, 2.5 Y.R. 7/4) in contrast to the dark gray color (Munsell, 2.5 Y.R. N-4) of the unweathered portions.

To determine if the mudstone at the site was identical in chemical composition to that of the outcrops, x-ray powder diffraction analysis was employed. Both weathered and unweathered samples were taken from the outcrops, as well as a weathered flake from the site. Each of the three samples was ground into a powder with a mortar and pestle and then mounted on a glass slide. Cu K radiation was passed through each sample and scanned at two degrees per minute using a goniometer. The angle of diffraction, which indicates specific minerals and their relative proportions, was recorded on a strip chart (Cu K gamma radiation).

The results show that the unweathered samples have a high dolomite content with some feldspar, quartz, albite, and a clay composed of illite and chlorite. The weathered samples are characterized by an abundance of sodium feldspar, but a low concentration of dolomite, with the other minerals being virtually the same as those in the unweathered samples. The strip charts show a remarkable resemblance in minerals and their concentrations in both the weathered sample from the outcrop and the weathered flake from the site (Fig. 10A&B). Why then is the unweathered sample, which is high in dolomite content, different (Fig. 10C)? We hypothesized that the mild acids in the soil, combined with water, leach out the dolomite, resulting in samples with a greater abundance of feldspar than dolomite. In order to test this hypothesis, some unweathered mudstone flakes were immersed in a solution of one part (6N) hydrochloric acid and five parts water for five days in order to simulate the weathering process. This

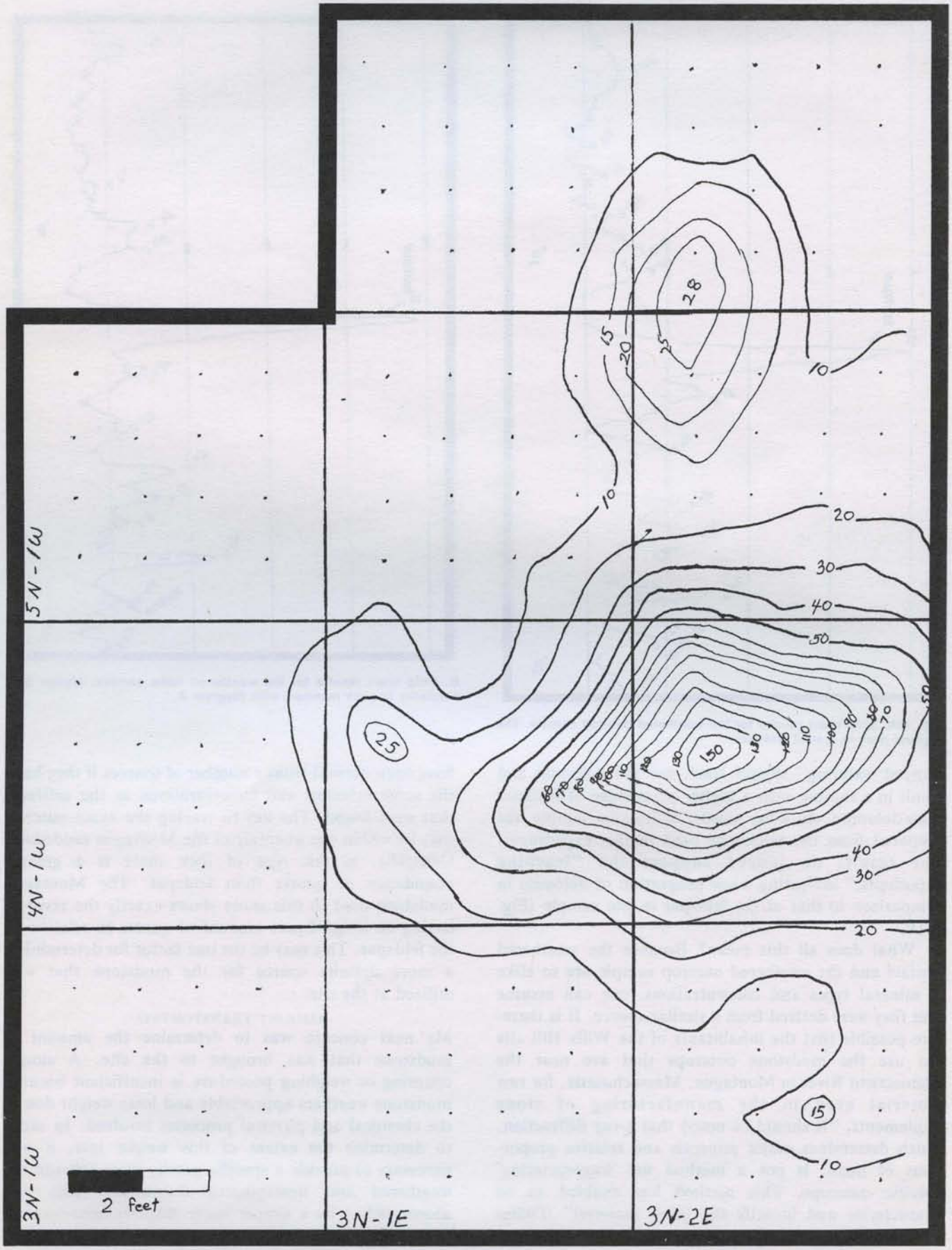

Fig. 9. Density contours of argillite flakes by count in excavated area of the site.

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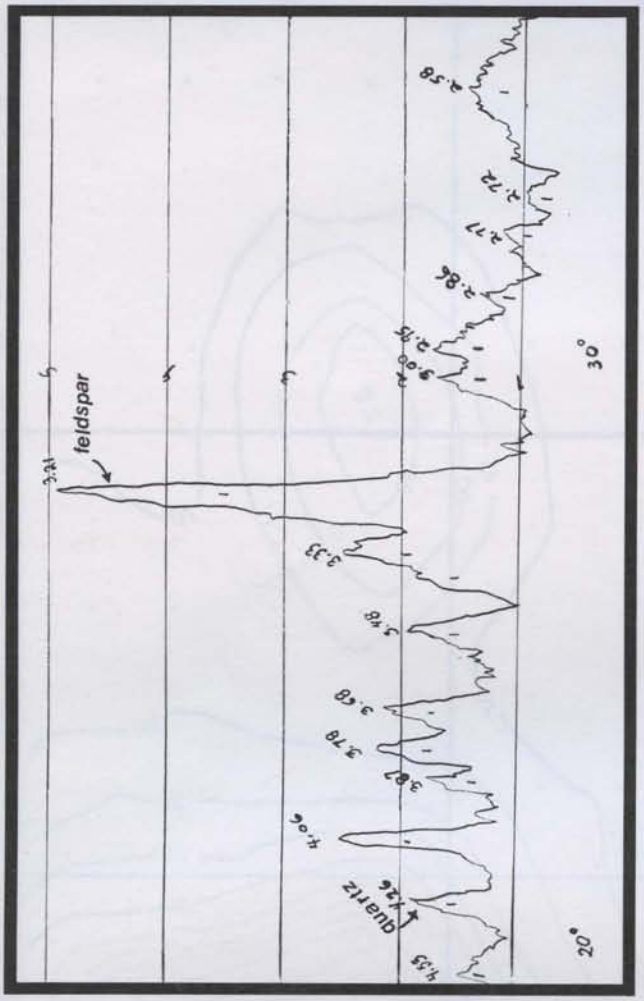
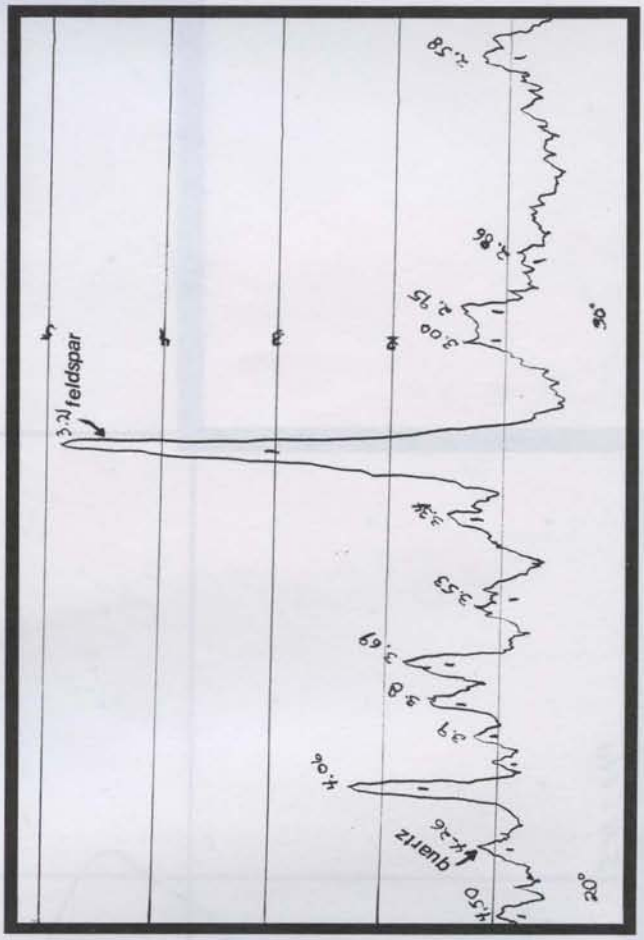


Fig. 10A. Strip chart results for the weathered outcrop sample. The highest peak is that of feldspar.



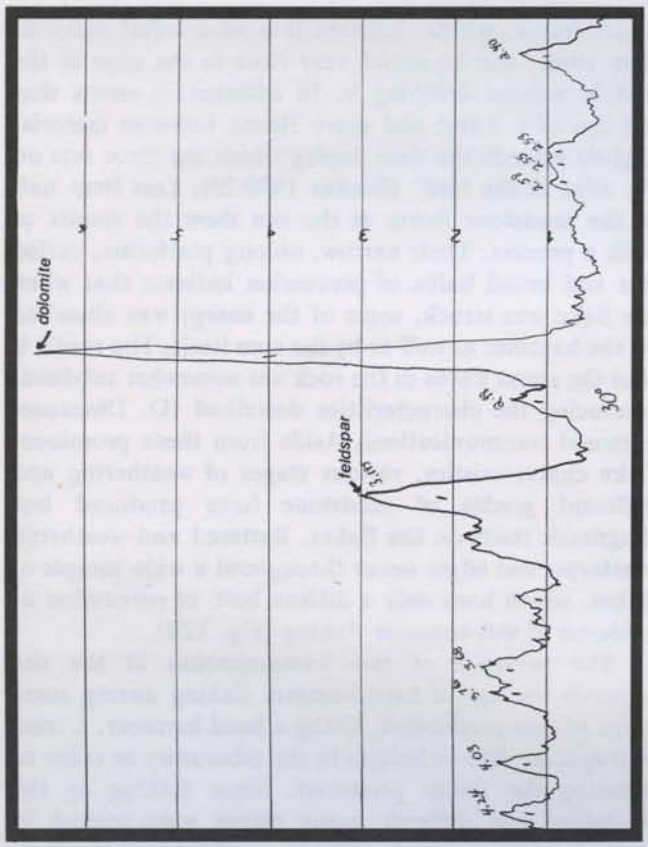
B. Strip chart results for the weathered flake sample. Notice the similarity in peak numbers with diagram A.

"forced watering" should leach out the dolomite and result in a sample with a higher percentage of feldspar than dolomite. An x-ray powder diffraction sample was prepared from the mudstone used in this experiment. The results do indeed support the "leaching hypothesis," indicating a low proportion of dolomite in comparison to that of the feldspar in the sample (Fig. 10D).

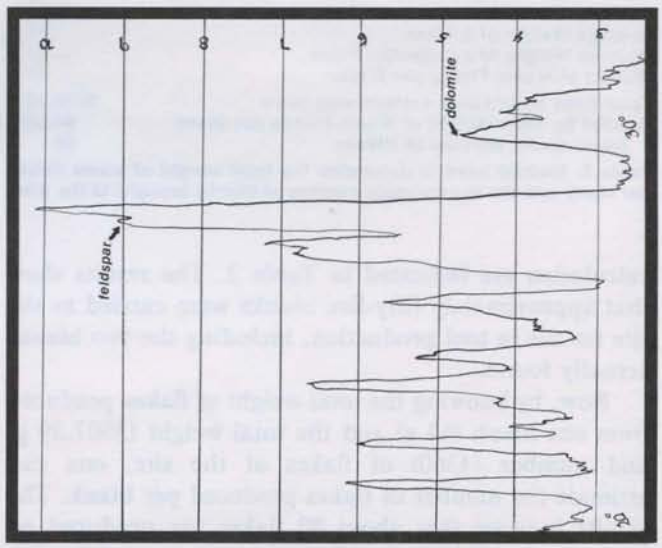
What does all this mean? Because the weathered artifact and the weathered outcrop sample are so alike in mineral types and concentrations, one can assume that they were derived from a similar source. It is therefore possible that the inhabitants of the Wills Hill site did use the mudstone outcrops that are near the Connecticut River in Montague, Massachusetts, for raw material used in the manufacturing of stone implements. "It should be noted that x-ray diffraction, which determines major minerals and relative proportions of them, is not a method for 'fingerprinting' specific outcrops. This method has enabled us to characterize and identify the lithic material" (Didier 1975:98). Therefore, the mudstone used at the site may have been derived from a number of sources if they have the same minerals and concentrations as the artifacts that were found. The key to tracing the exact outcrop may lie within one anomaly of the Montague mudstone. Generally, in this type of rock there is a greater abundance of quartz than feldspar. The Montague mudstone used in this study shows exactly the reverse, having an insignificant amount of quartz in relation to the feldspar. This may be the one factor for determining a more definite source for the mudstone that was utilized at the site.

AMOUNT TRANSPORTED

My next concern was to determine the amount of mudstone that was brought to the site. A simple counting or weighing procedure is insufficient because mudstone weathers appreciably and loses weight due to the chemical and physical processes involved. In order to determine the extent of this weight loss, it was necessary to provide a specific gravity ratio between the weathered and unweathered fragments. This was accomplished by a simple water displacement method (Table 1). The results indicate that the critical ratio is



C. Strip chart results for the unweathered outcrop sample. In this sample the highest peak is that of dolomite, differing from the results on A and B.



D. Strip chart results for a laboratory simulation of weathering. Notice here that the dolomite is at a lower peak than the feldspar.

1.6:1 (unweathered to weathered rock). The next step was to obtain the total weight of mudstone at the site. It should be noted here that since the site was not entirely excavated, there may be some mudstone debris left in the unexcavated squares at the easternmost extremity of the site. These squares may have contained debris that should be included within the workshop area. These squares were at the margin of the activity area; therefore, the density and clustering of cultural debris was approximated for the non-excavated squares by extending the density contours (Fig. 9). The total weight was then multiplied by the weight loss factor, resulting in an approximation to the total weight of unweathered mudstone that was brought to the site (Table 1). The experiment indicated that approximately 5648.62 grams of mudstone were carried to the site.

FORM OF TRANSPORTED MATERIAL

Having determined a possible source, and the nature and weight of mudstone at the site, it is possible to formulate questions about the form of the transported material.

Starting with bedrock slabs, the knappers produced smaller, more workable chunks called "quarry blanks." Therefore, the transported raw material may have entered the site in slab form or in blank form. If large bedrock blocks were brought to the site, one would expect to find thick, angular, and chunk-like pieces that would have been produced during the primary reduction of the unmodified slabs. One might also expect to find bedrock slabs which for some reason may not have been reduced by the toolmaker. Through visual analysis of the mudstone waste debris, I have concluded that, in the absence of any angular, thick and chunk-like pieces and the absence of bedrock slabs, only blanks were brought to the site for further modification.

Assuming that the processes involved in making mudstone projectile points were relatively constant during the short occupation of the site, the relative size and average weight of the blanks, projectile points, and flakes produced should also be fairly constant. Following this assumption, and examining the relationships among these characteristics, we should be able to answer some interesting questions about the production of mudstone tools. Assuming that blanks *were* brought to the site, can we determine how many were transported from the bedrock source? By using the method previously mentioned, one should be able to approximate the answer. The procedures and results of this

	WEATHERED FLAKES	UNWEATHERED CHUNK
Volume	27 ml	98.5 ml
Weight	50 g	292.5 g
Weight / Volume	1.85 g	2.97 g

RATIO between unweathered and weathered material = 1.6:1

TOTAL WEIGHT of weathered mudstone in workshop = 3530.39 g

ESTIMATED TOTAL WEIGHT of original unweathered material = 5648.62 g

Table 1. Determination of the weight loss factor between weathered and unweathered mudstone and determination of the total weight of mudstone at the site. The total weight figures are determined from the actual weight plus the extrapolated weights from the marginal unexcavated squares.

Average Weight of a Blank	87 g
Average Weight of a Projectile Point	—23 g
Weight of Waste Flakes per Blank	64 g
Total flake weight plus extrapolated value	3530.39 g
Divided by Total Weight of Waste Flakes per Blank	64.00 g
Approximate Number of Blanks	55

Table 2. Method used to determine the total weight of waste flakes per blank and the approximate number of blanks brought to the site.

calculation are indicated in Table 2. The results show that approximately fifty-five blanks were carried to the site for use in tool production, including the two blanks actually found.

Now, by knowing the total weight of flakes produced from one blank (64 g) and the total weight (3507.39 g) and number (4360) of flakes at the site, one can estimate the number of flakes produced per blank. The results indicate that about 80 flakes are produced on the average, in the manufacturing of a point from a blank (Table 3).

By simple size comparison it is evident that only one point could be manufactured from one blank, assuming that the points and blanks that were found are representative samples (Fig. 11). This means that about fifty-five points were also produced. It should be remembered that all figures presented here are approximations.

Total weight of mudstone flakes	3507.39*
Total number of mudstone flakes	+ 4360.00
Average weight of flake	.8 g
Total weight of flakes per blank	64.0 g
Average weight of flake	+ .8 g
Number of flakes per blank	80.0

Table 3. Method used to determine the average weight of flakes and the number of mudstone flakes per blank. This number (*) is the exact weight of flakes found at the site without the addition of the extropolated weight.

FLAKING TECHNIQUES

Looking at the workshop area more closely, we can attempt to form statements about the techniques that were used in the manufacture of the mudstone tools. The first step in this analysis involved a visual inspection of all of the mudstone flakes in order to categorize the techniques used in their production. Stone waste flakes are three-dimensional evidence of the ways in which tools were created. Each technique employed during production produces specific characteristics on the waste flakes.

From my analysis of the mudstone flakes at the site, I could identify only one definite type of man-made flake. These flakes have the following characteristics: a broad and diffuse bulb of percussion and a narrow, oblong shaped striking platform that exhibits a curled lip (Fig. 12A). These flakes have been interpreted as being the result of soft-hammer flaking (D. Dincauze: personal communication). "As the name implies, this method involves the use of a hard wood, bone, horn, or antler baton, which, because it is of a softer material than stone, can be struck very close to the edge of the nodule without crushing it. In addition, it seems that the use of a softer and more elastic hammer material slightly extends the time during which the force acts on the edge of the tool" (Bordaz 1970:25). Less than half of the mudstone flakes at the site show the results of such a process. Their narrow, oblong platforms, curled lips and broad bulbs of percussion indicate that when the flake was struck, some of the energy was absorbed by the hammer as well as by the core itself. The result is that the stress waves in the rock are somewhat subdued, producing the characteristics described (D. Dincauze: personal communication). Aside from these prominent flake characteristics, various stages of weathering and different grades of mudstone have produced less diagnostic traits on the flakes. Battered and weathered platforms and edges occur throughout a wide sample of flakes, which have only a diffuse bulb of percussion as evidence of soft-hammer flaking (Fig. 12B).

The presence of two hammerstones at the site suggests the use of hard-hammer flaking during some stage of tool production. Using a hard hammer, I tried to duplicate this technique in the laboratory in order to examine the flakes produced. Since flaking of the mudstone was difficult, some pieces were soaked in water for several days in order to see if this would aid in the flaking process. The soaking of the unweathered mudstone did aid greatly in the manufacturing. It is therefore possible that the need to soak raw material

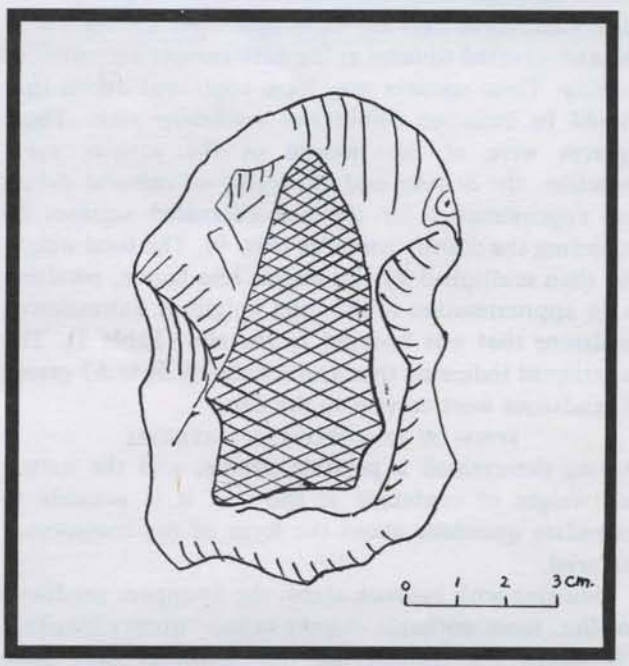


Fig. 11. Illustration showing the relative size of a projectile point to a quarry blank.

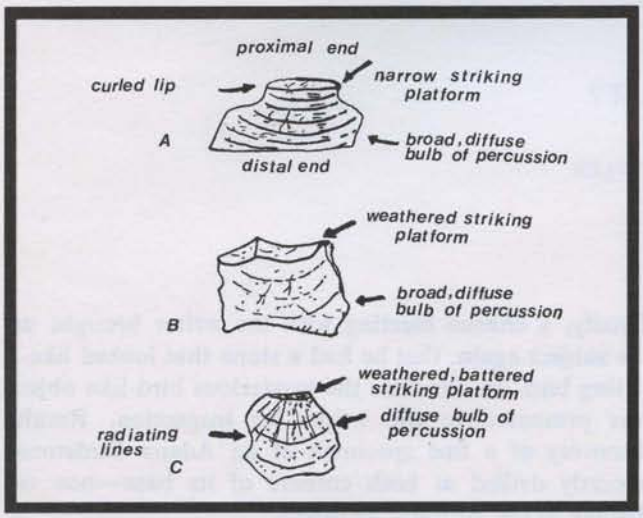


Fig. 12. Illustrations of flake characteristics and the effects of weathering on flakes. (A) indicates the most prominent flake characteristics while (C) shows fewer characteristics and (B) has the fewest recognizable flake characteristics. The effect of weathering on mudstone flakes make determination of their techniques of manufacture difficult.

was one of the reasons that the site was located near the stream. It is also possible that blanks, tools and flakes may be present in the stream, although this possibility was not investigated at the time of excavation.

The hard-hammered flakes showed no distinctive features, due to the nature of the mudstone's flaking properties. This would suggest that the majoritiy of the flakes at the site, which do not have any distinctive characteristics, may have been produced either by soft-hammer or hard-hammer techniques. Usually a hard hammer is employed in the initial shaping of the tools and a soft hammer is employed for the finer more delicate work. This may have been the case at the Wills Hill site.

The study of poor-grade raw materials that were used in prehistoric tool manufacture is still in its embryonic stages. Only through new techniques, and further interdisciplinary cooperation, can we begin to understand better the lithic technologies of prehistoric peoples in the Northeast.

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WHAT IS IT?

WILLIAM S. FOWLER

Upon recovery of a strange looking man-made artifact, something that often occurs, the query arises as to what it is. Usually the finder of the object keeps asking about it until at last the question is directed to a scientist connected with some museum. Even then evasive answers are frequently the result, depending upon whether or not the museum involved is of the right kind to make a correct interpretation of the recovered artifact. For example, not so long ago Ralph Waterman dug a hole beside his house in Seekonk for some household purpose, and brought up on his shovel a fanciful bird-like stone. Not being an archaeologist he was at a loss to know what he had found, except he realized—as he said afterward—that he had what appeared to be a carved stone that resemble a sitting bird. Then ensued a period of several years, during which he continued to seek the answer to his query: what is it? His field of inquiry extended to a midwestern museum—apparently the wrong kind—as they could give him no satisfaction.

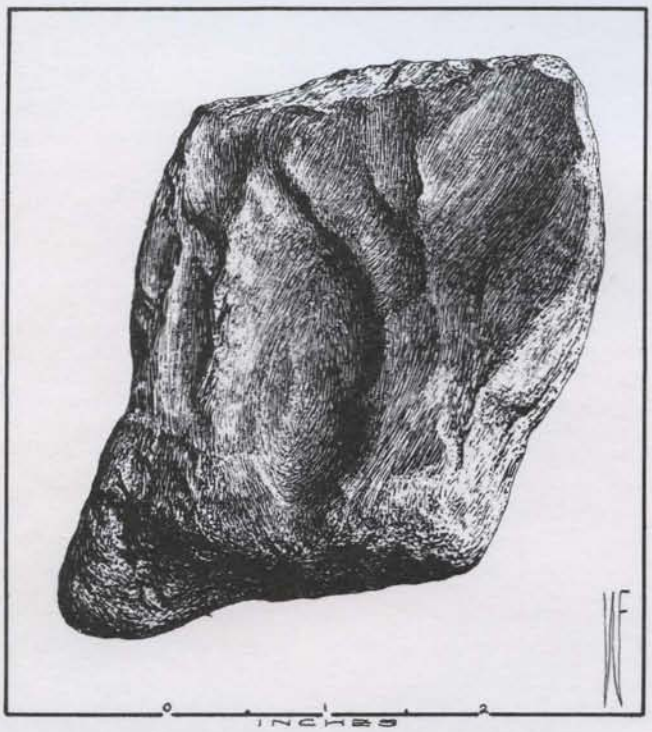

Fig. 13. GRAPHITE BLOCK, showing 7 worn hollows on one side; from Carbuncle Pond, R.I.

Finally, a chance meeting with the writer brought up the subject again, that he had a stone that looked like a sitting bird. In due time the mysterious bird-like object was presented to the writer for inspection. Result: discovery of a fine specimen of an Adena Birdstone, expertly drilled at both corners of its base—now on display in the Bronson Museum.

But the subject of this report is something else, with no such well-defined traits as those of a Birdstone. Recently a member of the Narragansett Archaeological Society of Rhode Island, Stephen Dlugosz, was surface hunting in the northwestern section of Rhode Island at Carbuncle Pond. Here he found bulldozers at work making a roadway along one side of the pond to connect with a new beach under construction. At a spot near the outlet of the pond on an elevated bank in disturbed loosened soil he discovered prolific evidence of aboriginal occupation in the form of chips and shell refuse. Soon after, he picked up a queerly worked block of graphite, which is illustrated for the purpose of permitting a more detailed inspection of it (Fig.13).

As will be readily noted there are 7 recognizable depressions in the block, one of which is relatively deep. This central hollow, at first glance, might suggest that this stone was used as a paint cup. However, upon closer examination of the specimen itself—too fine to be shown in the illustration—one discerns fine scratch marks in the several hollows. If used as a paint cup in which red or yellow ocher would have been mixed with animal grease, these hollows would have taken on a smoothed-over appearance without scratches. Especially in the large central hollow, may be seen a prominent ridge running lengthwise, which would appear to represent some kind of uneven wear. Presence of scratches here seems to indicate that it had been gouged out with a stone scraper.

As for the use of graphite; when it is uncovered at site excavations it occurs in relatively small lumps. Often these have worn spots, which appear to have been smoothed from rubbing. Such finds are presumed to have been used to spread graphite by rubbing over the surfaces of ceramic pots to make them less porous. Certain blackened potsherds from the Connecticut Valley, seemingly discolored by something other than char, have been thought to support this graphite treatment theory; a treatment probably used on stone

bowls of the preceding Late Archaic Age as well. From this it may be seen that the worked graphite block of this report appears to be something other than a ceramic pot rubber. It seems to be an object not ordinarily recovered, requiring a more comprehensive investigation of available related evidence.

An excavation report shows a further use of graphite extending into another field of activity, as may be gleaned from the following reference from C.C. Willoughby (1935:85-86). In 1933-34, 19 graves near Orwell, Vermont were opened by the Museum of the American Indian, Heye Foundation of New York. The site lay on the eastern shore of Lake Champlain, opposite Fort Ticonderoga. Bone residue of the graves showed signs of cremation—probably of the Late Archaic—and most of the burials contained considerable amounts of pigment, either red ocher or graphite. The reported use of ground graphite in this instance suggests that this black pigmentary stone served an important purpose in burial ceremonies.

Then there is other evidence to support a presumed use of graphite in get-well treatments for the sick, as performed by a medicine man, the spiritual and religious leader of the people. In an early Bulletin issue, W.J. Howes (1942) advances an interesting theory worth repeating. It is based upon Adena Blocked End tubes of indurated clay, as found in a South Hadley Falls grave, uncovered beside the road, half way to Granby. Along with rolled copper beads, bone beads, and a lump of graphite, appeared 2 Blocked End tubes, 9-½" and 6-½" in length. A small hole perforated one end of each, extending in a short way only, where it opened into a large 3/4" diameter perforation. This continued throughout both tubes to the opposite end. On the interior walls of the long tube was an incrustation that felt slippery to the touch, similar to the feeling of graphite. Examination under the glass of scrapings from these tubes showed that the contents of the longer tube actually looked like scraped graphite. Contents of the shorter tube, on the other hand, appeared to contain particles with a cellular vegetal structure, suggesting that they might have been ground from charcoal. Smaller tubes from the 1868 Holyoke Adena graves and from those at Turner's Falls are reported to have contained brownish or red incrustations. This suggests that small sized tubes might have contained colored pigments, while larger ones, such as those from South Hadley Falls, contained black pigments obtained from graphite or charcoal.

To illustrate the use of such tubes, had they been filled with graphite pigment, Howes presents this hypothetical scene. The shaman, or medicine man, called in to cure a severely stricken patient, proceeds to the side of the sick one. Not to delay his appearance, graphite or other colored pigments probably would have been prepared in advance, consisting of mixtures of powder and grease. If this imaginary situation actually took place, then it would seem that the stone tubes would have made ideal containers for these pigments. A stone plug—some have been recovered—or one of wood inserted in the small hole would have held the pigment until needed. Then a wooden plunger in the large hole at the other end of the tube could have been used to force the pigment out of the small hole in the required amount for painting the face or body of shaman or patient.

Another use for black pigment as paint came at the time of burials, as reported by De Forest (1851:22): "during this[burial] ceremony, the relatives with their faces painted black in token of mourning, stood by the grave." And from William Wood in 1634 (1898:98) of burials . . . "continuing annuall mournings with a blacke stiffe paint on their faces:"

And still another use for this kind of facial coloring occurred in times of warfare, as described further by Wood (1898:89) "When they goe to their warres, it is their custome to paint their faces with diversitie of colours, some being all black as jet . . . some halfe red and halfe black, some blacke and white,"

These few references will serve to furnish some idea of the extent to which black paint was used. And as mentioned in several places, graphite seems to have been one source for the required pigment. This being the case, it is now possible to envisage how the worked graphite block form Carbuncle Pond was used. Instead of serving as a paint cup, its several depressions, seemingly hollowed out by scraping, would appear as the result of removal of graphite powder. That such a source for supplying black pigment existed seems amply demonstrated by this significant recovery. Possibly the reason for the rarity of this kind of artifact in surface hunting or in the excavation of sites lies generally in the completely worked-out condition of such blocks, due to an incessant demand for graphite powder, as suggested by early commentator reports such as those mentioned in this paper.

Bronson Museum
October 1971

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